Doherty Memorial High School

299 Highland Street, Worcester, MA 01602

MSBA Feasibility Study

Preferred Schematic Report (PSR)

DRAFT: December 13, 2019

MSBA
Massachusetts School Building Authority
40 Broad Street, Suite 500, Boston, MA 02111

OWNER
City of Worcester, MA
City Hall, 455 Main Street, Worcester, MA 01608

OPM
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Lamoureux Pagano Associates | Architects
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Prepared by:

LPA|A

Items highlighted in red are not included in this draft submission.

3.3.1 INTRODUCTION

A. Executive Summary

B. MSBA PDP Review and District Response

C. Updated Project Directory

3.3.1 INTRODUCTION

A. Executive Summary

Process since PDP: The Preliminary Design Program (PDP) was submitted to the MSBA on September 10th, 2019. Since then, development of the Preferred Schematic Report (PSR) has continued in cooperation with the City of Worcester, Worcester Public Schools, Owner's Project Manager and other team members in accordance with MSBA guidelines. MSBA's PDP review comments were received on October 30th, 2019 followed by a conference call to review the team's response was held on November 15, 2019.

The three options voted for further review in the PSR phase include:

- Code Upgrade: at the existing Doherty Memorial High School
- Renovation/Addition: at the existing Doherty Memorial High School for 1670 students
- New construction: 1670 student facility at the existing Doherty site
- New construction: 1670 student facility at the Foley Stadium site
- New construction: 1670 student facility at the Chandler Magnet School site

A steering committee with representatives of the school district, the city administration, the OPM and the Design Team met on a biweekly basis as the PSR phase progressed. Several update meetings were held with the City Manager, the Mayor and other district representatives. Additionally, the following community meetings were held:

- October 1: WPS meeting to review Chapter 74 program requirements
- October 3: Meeting with Worcester Parks Department and Worcester Public Schools Athletics representatives
- October 7: Doherty Memorial High School Faculty presentation
- October 30: Friends of Newton Hill presentation
- December 9: Building Committee meeting and public presentation
- December 18: Building Committee meeting to vote on Preferred Solution

The following is the link to the Worcester Public School website featuring project updates for public viewing:
https://worcesterschools.org/school-subpage/doherty-memorial-high-school-building-project/

Project Schedule: The project is on schedule to submit the Schematic Design package to MSBA by July 8, 2020 and to be on the agenda for Project Scope and Budget approval at the MSBA Board of Directors meeting on August 26, 2020. Pending MSBA Board approval, the City Council vote to appropriate funding will follow. With anticipation of early bid packages to expedite the process, construction is expected to begin in the summer of 2021. Occupancy of the building is slated for the fall of 2024, with some sitework to follow.

Final Evaluation of Existing Conditions: Since the submission of the PDP in September 2019, additional information was gathered relative to the site surveys including metes and bounds for three properties, as well as desktop traffic and geotechnical reports. Additionally, further analysis of opportunities for City funded enhancements adjacent to and nearby the sites was studied. This includes additional studies of City owned properties that could be augmented for long term project improvements with recognition that none of the studied sties could meet the full site program for the Doherty project. These studies primarily focused on opportunities to improve athletic field features and amenities that could be included in the City's long term capital program.

Additional scope is recommended for future phases of the MSBA project and includes: interim subsurface geotechnical exploration, more detailed survey of significant site features, and advanced traffic recommendations for the preferred site.

Final Evaluation of Alternatives: The PDP identified five options on three sites for further development during the Preliminary Schematic Report (PSR) phase of this Feasibility study. The following describes the alternatives:

- **Code Upgrade Option:** The Code Upgrade option at the existing Doherty Memorial High School was advanced for further study primarily as a gauge for comparison against the other Renovation/Addition and New Construction options. The option proposes to utilize temporary modular classrooms, located west side of the existing building, as swing space for the duration of a lengthy phased/occupied renovation. It fails to meet the Educational Program requirements described in this Feasibility Study and the phased construction schedule while the school is occupied would be significantly disruptive to the curriculum delivery during construction.

- **Renovation/Addition Option:** The renovation/addition option to the existing Doherty Memorial High School features a multi-phased construction option assuming that the school would be fully occupied during construction. The solution presented includes new construction centralized core facilities, a multi-story new construction academic wing, significant renovations to existing academic wings, and an athletic field above a parking garage. The result is a sprawling facility that fills out the majority of the developable site area. Academic wings are separated and the media center, while centrally positioned, is isolated from much of the school. With the extended construction schedule and complexities of phased occupied construction, the cost estimate for the work is close to that of new construction. While the option addresses existing conditions concerns about dispersed core facilities, lack of accessibility, and systems deficiencies, limitations with the existing floor to floor dimensions and hazardous materials do not make this facility a good candidate for renovation and additions. Due to the compromised educational program, existing conditions limitations, and the overall expense and schedule issues, the renovation/addition renovation option was not recommended as the Preferred Solution.

- **New Construction Options Doherty Site:** After review of numerous options for new construction on the existing Doherty site, three distinct options were developed for further evaluation. In all cases, it was assumed that the existing facility would remain in full operation during construction. For that reason, the east side of the site was the focus of the analysis, effectively displacing the existing practice fields, but maintaining the existing school with parking sufficient for staff and visitors at a minimum. All options are approximately 420,000gsf, multi-story solutions that terrace up the site from Highland Street toward Newton Hill following the existing contours.

Option A.1 Pods on the Park: The option is generally organized with core facilities and the main entrance grouped on the west side of the building facing the parking and athletic fields. The academic wings are organized in pods to optimize daylight opportunities and break down the scale of the elevations that face Park Ave. The massing gradually steps up the site and effectively diminishes the scale of such a large facility. A 100-car parking garage is included at the south end of the building, allowing for parking to be available immediately at the completion of construction and reducing the site area required for vehicular parking. The site plan includes a strategy to separate parent pick up/drop off from bus circulation, full perimeter access, separate service delivery access on the west side and surface parking as well as an artificial turf multipurpose field and other amenities at grade level.

Option A.2 Olmstead Homage: In an effort to limit disruption to the existing site and include all core facilities at the main entrance level, the option includes academic organization that wraps the auditorium and gymnasium with some daylighting compromises and potential issues with separating the core facilities from academic areas after hours. The massing of the solution is compact but provides limited opportunities to break down the scale of the facility. A separate level of parking at the north end of the building would provide about 140 – 150 spaces, allowing for more open site features.

Option A.3 Highland Proud: Featuring the main entry at the Highland Street elevation, the option includes a terraced plan organized around a strong north/south circulation spine. A secondary entrance at the gymnasium level is positioned for after hours use and convenient access to parking and the athletic field. The site plan features a Highland Street forecourt with bus circulation, separate parent pick-up/ drop off at side the gymnasium entrance, and an elevated athletic field with parking below. The main entrance and first floor program elements are somewhat isolated from the balance of the facility. Concerns were raised about the limitations of an elevated athletic field in terms of run off space and expense.

Preferred Doherty Option: After discussion of the merits and limitations of each Doherty new construction option, there was consensus that the A.1 Pods on the Park option offered the most potential for further development based on the following factors:

- Clear separation of academic spaces from core facilities with simple organizational principles for clarity of orientation and circulation
- Best opportunities for daylight in the most appropriate areas

  - Options for optimizing the available site features due to parking garage under the building
  - Appropriate massing for the site and adjacencies
  - Opportunity for clear separation of construction site from the existing facility during construction

- **New Construction Foley Stadium Site:** New construction at the existing Foley Stadium site requires demolition of the existing District Wide athletic facility including the only competition track in the school district, recently refurbished football field, bleachers and associated buildings, and additional athletics fields. The option includes a plan suitable for the relatively flat site. Poor soil conditions limit under grade construction and would require pile foundations. The main entry and core facilities are organized to face Chandler Street with academic wings fanning out toward the back of the site. Surface parking and a small multipurpose field fill out the additional site area available. Multiple points of entry to the site are advantageous for vehicular traffic options on site. However, the deep ash fill and peat soil make this a geotechnical challenge for development. Use of the Beaver Brook Park fields on the opposite side of Chandler Street is available through permission of the Parks department. An advantage of the Foley Stadium site is that the existing Doherty program could remain as is until the new construction is complete. A major disadvantage is that the District wide athletic facilities would need to be replaced and such a capital project has not yet been developed.

- **New Construction Chandler Magnet School Site:** The existing site configuration at the Chandler Magnet School is challenging to meet the program due to elevation changes and a narrowing at the center of the site. For that reason, additional land would be required to provide adequate space for the facility. The site is prominently located on major routes with multiple points of access. The option features a main entry at the lowest level facing Chandler St. with most core facilities one level up with access through the rear. The academic wings are relatively well separated from the community use spaces and have potential to be developed for strong organization. Surface parking is dispersed between the Chandler St. level and the rear athletic fields. Demolition of the existing Chandler Magnet School would be required for the option, but the District does not have a relocation plan for the 500 dual language elementary students that are currently housed there.

PSR Preferred Solution: **[To be finalized at 12/18/19 Building Committee Meeting]**

Opportunities to enhance Doherty Options

At the request of the Building Committee, the Design Team analyzed opportunities to enhance existing City owned parcels within the Doherty quadrant. The purpose of the expanded study was to consider improvements to optimize athletic fields in the vicinity of the potential school project. The request was borne out of the acknowledgment that no sites under consideration for the school project could fully meet the site program, but augmented and improved parks and school properties in the vicinity could ameliorate the issue. It is acknowledged that any off-site improvements listed would not be considered reimbursable by MSBA, but might be a worthwhile investment by the City for the community as well as the school district. The following options were considered:

- Duffy Field improvements for athletic fields as well as parking
- Newton Hill Park trail improvements
- Foley Stadium parking and connections
- Foley Stadium field improvements
- Chandler Magnet School field improvements

All park properties are operated and maintained by the City of Worcester Parks Department and the Foley Stadium and Chandler Middle School properties are operated and maintained by the Worcester Public Schools – which is a consideration for the mechanics of any improvement project.

Several important considerations informed the Final Evaluation of Alternatives as follows:

- **Existing Conditions:** Due to the extensive scope required to improve the existing Doherty Memorial High School to meet current code requirements and the limited height available for new systems integration, the Code Upgrade and Renovation/Additions option were not deemed viable candidates for the project.
- **Schedule:** Due to the requirement to maintain the existing Doherty school in operation during construction, the schedule for new construction at the current site extends out to the spring of 2025 for completion of the site work. While both the Foley Stadium and Chandler Magnet School sites are desirable as options that could be developed without disturbing the existing program or site, the advantage is overshadowed by the imperative to find replacements for the Foley Stadium and Chandler Schools respectively. Code Upgrade and Renovation/Addition options would have even more extended schedule implications than the New Construction options. There is no designated City owned space available for relocation of the programs nor is there a capital plan in place for their replacement.
- **Traffic Studies:** updated traffic reports included in the PSR submission indicate that increased traffic would be a significant impact at the Foley Stadium and Chandler Magnet sites and mitigations would be recommended. The existing Doherty site is located on a busy thoroughfare and the area currently experiences some slowed traffic during the school opening and closing periods. Additionally, Highland Street is a major artery in the city and is commonly used by emergency vehicles. With a larger enrollment and staff planned for Doherty, additional traffic is expected and would need to be addressed, but would be a less dramatic change than at the other sites without existing high schools.

- **Soil Conditions:** Available geotechnical information on the Doherty and Chandler sites indicates reasonable soil conditions for typical construction. The Foley Stadium site consists of poor bearing capacity, filled soil and pile foundations are recommended. Additionally, a conduit for Beaver Brook would need to be relocated to avoid an under-building location.

Each of the design options included in the PSR are described by written narratives and graphics (site/floor plans, phasing plans, massing models, design/construction schedules and each option's merits and limitations). Supporting documents include updated Basis of Design Narratives, Permitting Requirements, Comparative Budget Data and a Summary of Merits/Limitations. Refer to Section 3.3.3.E. Budget Comparison and 3.3.3.F. Merits and Limitations.

3.3.1 INTRODUCTION

B. MSBA PDP Review and District Response

The following review comments have been marked up with the responsible party in red font after each review comment. Items highlighted in yellow must be addressed in the response to the PDP review comments, which is due by November 14th.

This document has been updated by LPA with comments for the purpose of preparing a coordinated response from the District, OPM and LPA. District/LPA responses to specific MSBA comments are in red with 12-point Gothic A1 font.

ATTACHMENT A
MODULE 3 – PRELIMINARY DESIGN PROGRAM REVIEW COMMENTS

District: City of Worcester
School: Doherty Memorial High School
Owner's Project Manager: Tishman Construction Corporation of MA
Designer Firm: Lamoureux Pagano & Associates, Inc.
Submittal Due Date: September 11, 2019
Submittal Received Date: September 10, 2019
Review Date: September 10 - October 25, 2019
Reviewed by: R.Whidden, C.Alles, J.Jumpe

MSBA REVIEW COMMENTS

The following comments[1] on the Preliminary Design Program (PDP) submittal are issued pursuant to a review of the project submittal document for the proposed project presented as a part of the Feasibility Study submission in accordance with the MSBA Module 3 Guidelines.

3.1 PRELIMINARY DESIGN PROGRAM

Overview of the Preliminary Design Program Submittal	Complete	Provided; *Refer to comments following each section*	Not Provided; *Refer to comments following each section*	Receipt of District's Response; *To be filled out by MSBA Staff*
OPM Certification of Completeness and Conformity	☒	☐	☐	☐
Table of Contents	☒	☐	☐	☐
3.1.1 Introduction	☒	☐	☐	☐
3.1.2 Educational Program	☐	☒	☐	☐
3.1.3 Initial Space Summary	☐	☒	☐	☐
3.1.4 Evaluation of Existing Conditions	☐	☒	☐	☐
3.1.5 Site Development Requirements	☒	☐	☐	☐
3.1.6 Preliminary Evaluation of Alternatives	☐	☒	☐	☐

3.1.7 Local Actions and Approvals Certification(s)	☒	☐	☐	☐
3.1.8 Appendices	☒	☐	☐	☐

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[1] The written comments provided by the MSBA are solely for purposes of determining whether the submittal documents, analysis process, proposed planning concept and any other design documents submitted for MSBA review appear consistent with the MSBA's guidelines and requirements, and are not for the purpose of determining whether the proposed design and its process may meet any legal requirements imposed by federal, state or local law, including, but not limited to, zoning ordinances and by-laws, environmental regulations, building codes, sanitary codes, safety codes and public procurement laws or for the purpose of determining whether the proposed design and process meet any applicable professional standard of care or any other standard of care. Project designers are obligated to implement detailed planning and technical review procedures to effect coordination of design criteria, buildability, and technical adequacy of project concepts. Each city, town and regional school district shall be solely responsible for ensuring that its project development concepts comply with all applicable provisions of federal, state, and local law. The MSBA recommends that each city, town and regional school district have its legal counsel review its development process and subsequent bid documents to ensure that it is in compliance with all provisions of federal, state and local law, prior to bidding. The MSBA shall not be responsible for any legal fees or costs of any kind that may be incurred by a city, town or regional school district in relation to MSBA requirements or the preparation and review of the project's planning process or plans and specifications.

3.1.1 INTRODUCTION

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Summary of the Facility Deficiencies and Current S.O.I.	☒	☐	☐	☐
2	Date of invitation to conduct a Feasibility Study and MSBA Board Action Letter	☒	☐	☐	☐
3	Executed Design Enrollment Certification	☒	☐	☐	☐
4	Narrative of the Capital Budget Statement and Target Budget	☒	☐	☐	☐
5	Project Directory with contact information	☒	☐	☐	☐
6	Updated Project Schedule	☒	☐	☐	☐

MSBA Review Comments:

No review comments for this section.

3.1.2 EDUCATIONAL PROGRAM

Provide a summary and description of the existing educational program, and the new or expanded educational vision, specifications, process, teaching philosophy statement, as well as the District's curriculum goals and objectives of the program. Include description of the following items:

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Grade and School Configuration Policies	☐	☒	☐	☐
2	Class Size Policies	☐	☒	☐	☐
3	School Scheduling Method	☐	☒	☐	☐
4	Teaching Methodology and Structure				
	a) Administrative and Academic Organization/Structure	☒	☐	☐	☐
	b) Curriculum Delivery Methods and Practices	☒	☐	☐	☐
	c) English Language Arts/Literacy	☒	☐	☐	☐
	d) Mathematics	☐	☒	☐	☐
	e) Science	☐	☒	☐	☐
	f) Social Studies	☐	☒	☐	☐
	g) World Languages	☐	☒	☐	☐
	h) Academic Support Programming Spaces	☐	☒	☐	☐

	i) Student Guidance and Support Services	☐	☒	☐	☐
5	Teacher Planning and Professional Development	☐	☒	☐	☐
6	Pre-kindergarten *(not applicable)*	☐	☐	☐	☐
7	Kindergarten *(not applicable)*	☐	☐	☐	☐

8	Lunch Programs	☐	☒	☐	☐
9	Technology Instruction Policies and Program Requirements	☐	☒	☐	☐
10	Media Center/Library	☐	☒	☐	☐
11	Visual Arts Programs	☐	☒	☐	☐
12	Performing Arts Programs	☐	☒	☐	☐
13	Physical Education Programs	☒	☐	☐	☐
14	Special Education Programs	☐	☒	☐	☐
15	Vocation and Technology Programs				
	a) Non-Chapter 74 Programming *(not applicable)*	☒	☐	☐	☐
	b) Chapter 74 Programming	☐	☒	☐	☐
16	Transportation Policies	☒	☐	☐	☐
17	Functional and Spatial Relationships	☒	☐	☐	☐
18	Security and Visual Access Requirements	☐	☒	☐	☐
19	English Language Learners (ELL)	☐	☒	☐	☐

MSBA Review Comments:

As part of the Preferred Schematic Report, provide an updated Educational Program that addresses the comments below. Please provide two copies: one (1) redlined version and one (1) clean copy.

1) In response to these review comments, clarify whether Advanced Academy courses will be open to students who are not members of the Advanced Academy program.

District Response: (DMHS/WPS) The Advanced Academy courses focusing on the biomedical and biotechnological sciences will be available only to students accepted into the program.

2) The information provided indicates that science classes range from 24 to 27 students. The MSBA's science lab guidelines are written to accommodate no more than 24 students per lab. Verify that the class size policy for science labs will not exceed that number.

District Response: The National Science Teacher Association safety guidelines recommend no more than 24 students in a laboratory setting at one time. Another guiding document – the STEM Learning Design's *Review and Recommendations of Best Practices for K–12 STEM Learning Spaces* report – also recommends a maximum of 24 students in the laboratory. In addition, the

Worcester Public Schools contract designates a maximum teacher load of 125 students, and all teachers are assigned 5 teaching periods, resulting in 25 students per class. All classes will be scheduled with safety recommendations in mind.

3) The information provided notes that the District intends to "add three vocational programs as well as an advanced academy with a curricular focus on the biotechnology/ biomedical sciences" to Doherty Memorial High School's existing academic programming, and notes that "[t]hese four additional programs would be open to all students from across the district" (p. 28). The information provided indicates that approximately 481 students may participate in these additional programs. Please clarify whether these 481 students are in addition to the 1,670- student enrollment agreed to with the MSBA, or if they are included in the 1,670-student figure.

District Response: When the enrollment projections for the project were determined, the committee took into account the existing vocational program (Engineering Technology) as well as anticipated population trends across the city. After planning sessions, visioning exercises, and community input, the committee has included the three additional vocational programs and the advanced academy, all of which are available to students from across the district. There is a possibility that there may be greater student interest in Doherty and/or the available programming than expected. If so, then the student population could surpass 1,670.

Therefore, the district has decided to reduce the enrollment of the new vocational programs that are held during the school day without changing the space summary specifications.

- Programming and Web Development: Reduce from 200 to 160 students
- Marketing, Management and Finance: Reduce from 200 to 160 students
- Construction Craft Laborer: Reduce from 150 to 120 students

In planning for the future, the school will have the capacity to increase the student population within these programs. Similar to the Innovation Pathways Program, the school would have the capacity to offer course offerings for students after–school hours.

4d) The information provided indicates that "[t]here are plans to grow the mathematics program by offering courses as part of the Early College High School program in partnership with Worcester State University and/or Quinsigamond Community College" (p. 36). Please clarify whether this anticipated program growth will require additional classrooms/square footage over time and indicate how many additional classrooms and/or associated departmental spaces are anticipated to be required.

District Response: (DMHS/WPS) There is no request for additional classrooms or spaces more than what was proposed in the PDP. Students taking an Early College or dual enrollment course will either enroll in the course during the day in lieu of a regularly scheduled mathematics course, or these courses may be offered during non–school hours.

The information provided notes, "[w]e anticipate adding space and staff to the math department due to the projected increase in enrollment and the addition of courses… to our current course offerings" (p. 37). Please provide the anticipated cost for new Math Department staff as part of the budget statement included in the District's Preferred Schematic Report. Additionally, provide the anticipated cost for all new staff anticipated as part of this project as part of the budget statement included in the District's Preferred Schematic Report; the MSBA notes additional staff is also called for in the following areas: Science, Social Studies, Professional Development, Health Center, Art, Health Education, Special Education, Advanced Academy and Chapter 74 programs.

District Response: This item will be further addressed within the PSR.

The district and school are seeking to add additional staff due to both increased enrollment and increased program offerings. Recent changes to Mass Core have increased graduation requirements which directly impacts course offerings. For example, four years of mathematics is now required for graduation and as a result, there is a need for additional staff in order to offer courses to meet this requirement. Consistent with the goals of the Strategic Plan for Worcester, additional staff is needed in order to expand and to diversify the current course offerings, and to expand the Advanced Placement program. An increase in staff will allow us to moderate class size to adhere to district staffing ratios and to better serve the needs of all learners.

A Capital Budget statement will be submitted within the PSR to demonstrate projected operating costs, including costs associated with increased staffing.

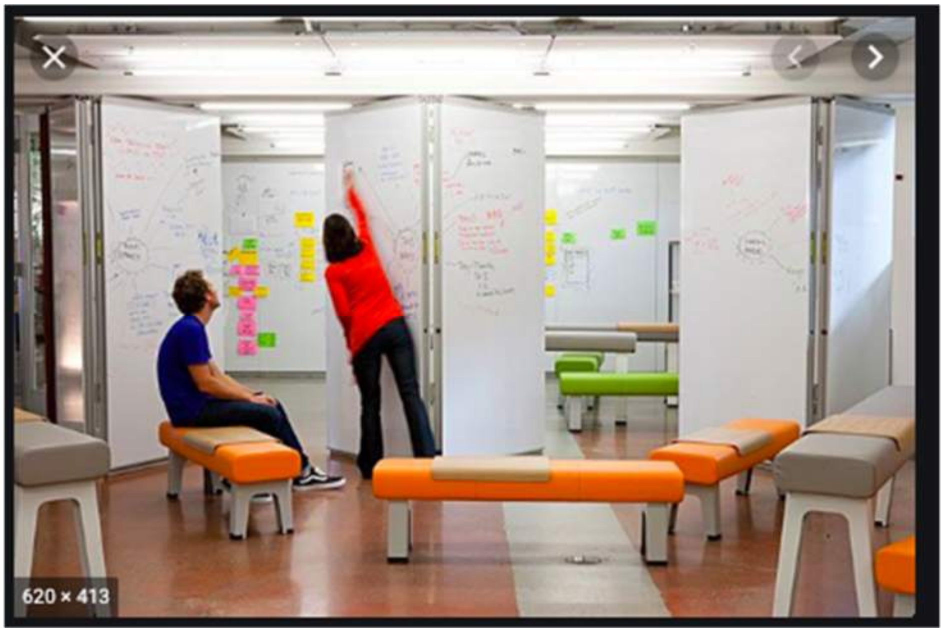
4e) The information provided notes that science labs in the current Doherty Memorial High School are clustered along a single hallway. Describe how these spaces will be arranged in the proposed project to accommodate both the current departmental organization as well as a possible shift toward a more integrated, interdisciplinary approach. Similarly, in response to these review comments, describe how spaces for each academic department – which, like science, appear to be clustered in the existing facility – will be organized in the proposed project to meet current and future needs.

District Response: (DMHS) Doherty is planning for flexible spaces to support several variations of organization to address current and future needs. This includes Grade 9 teams, with Grades 10–12 pairings between departments: for example, the English and Social Studies departments would be paired, while Mathematics and Science would also form a departmental pairing.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

4f) The information provided calls for common areas within eyesight of classrooms to be used for student break-out sessions and for faculty to hold Professional Learning Community meetings. In response to these review comments describe any acoustical or visual privacy requirements these spaces may have as well as their required size, furnishings and equipment.

District Response: (DMHS) These areas will allow for flexible orientations, and will have flexible furnishings to account for current and future needs. There are no specialized acoustical requirements beyond the acoustical classroom separations planned for the school. We anticipate using materials, for example whiteboard walls that pivot (see image below), that provide visual privacy when needed.



4g) The information provided references a Global Learning Lab. In response to these review comments, describe the desired size, layout and equipment for such a space, describe how it will be staffed and scheduled, and clarify why a specialized space is required rather than world language rooms that are equipped for listening, recording and interactive activities during class time.

District Response: (DMHS) The Global Learning Lab will be utilized primarily by the World Languages Department, though other classes requiring the available technology could certainly benefit from this space. The World Language Department Chair will be responsible for maintaining the schedule and coordinating the logistics of use of the space.

As explained in the PDP statement (p. 44–45), Doherty had a functional language laboratory within the department prior. This space included desktop computers that included specialized software to enable students to integrate technology as they engaged with the curriculum: students were using the distributive technology to research the culture and history of the countries associated with the target language, to practice their speaking and listening skills using a multi– track audio editor and recorder computerized program, and to practice for and ultimately take the speaking component of the Advanced Placement Language (Spanish) exam.

However, during the 2018–2019 school year, this space was reallocated to general classroom use by multiple departments due to severe overcrowding. The Chromebook technology available for most general education classrooms is not sufficient to enable all necessary curricular activities to occur.

The restoration of the Global Language Lab will support student fluency essential for preparation for the students' AP exams as well as those seeking the Seal of Biliteracy. The MA Seal of Biliteracy Recognizes high school graduates who attain proficiency in two or more languages by high school graduation. The MA Seal of Biliteracy, adopted from the state, takes the form of a seal that appears on the transcript and diploma of the graduating senior. This recognition may be presented to colleges and future employers.

4h) The information provided notes that students in the AVID program receive additional support from tutors who are community volunteers (p. 52). In response to these review comments describe the type of access they have to the school during the school day and clarify whether their movement in the school is (or should be) restricted.

District Response: (DMHS) The AVID program requires and benefits from community–based tutors. Like all other visitors, these tutors will be permitted access to the building through our main office entry and will be permitted access to the AVID classroom only. The school currently implements protocols regarding visitor access, including parent/guardian(s) and other community members. These protocols limits visitor access to the room (office, classroom, etc.) applicable to their visit only.

4i) The information provided calls for "a large conference room/presentation space with seating for 30-40 people and a smaller conference room/presentation space with seating for twenty people" (p. 56). In response to these review comments, describe the types of uses each of these proposed spaces would accommodate and explain why a single presentation space would be insufficient to meet the District's needs.

District Response: (DMHS) During the course of the day, there is a need for multiple meeting spaces to accommodate the range of presentations that can occur simultaneously. Colleges visit the school and host information sessions for students during the school day. A large conference room which can accommodate 30-40 people will allow for these types of informational and instructional sessions within the school day. Additional group meetings such as IEP meetings, and team meetings such as the Graduation Improvement Team, Attendance Team, and the Instructional Leadership Team, meet throughout the day. These groups require a private meeting space that can accommodate these groups, which often have 15-18 members. Two separate conference rooms/meeting spaces will allow for these programs and meetings to occur simultaneously without limiting the instructional/informational opportunities for students. Due to current limitations, Doherty often does not host district-level professional development or district-based administrative meetings: flexible and variable conference and presentation space will allow Doherty to benefit from visitors and trainers.

When considering the use of these proposed spaces, and possibilities for shared usage, it was determined that the Guidance department can utilize the Career Center space for the 30-40 person meetings, but will require a smaller private conference space for 15-18 people. This will be reflected in the updated PSR Space Summary.

5) *The information provided calls for increased teacher collaboration opportunities in the proposed project. In response to these review comments, describe the steps the District has taken/is currently taking/will take to support and provide professional development for faculty and staff. Clarify the District's approach to scheduling teacher preparation periods in order to support interdisciplinary sharing, including*

sharing between teachers in core academic departments and specials.

District Response: (DMHS) In order to support the district's goal of leadership, shared responsibility, and professional collaboration to establish a community of practice through leadership, shared responsibility for all students, and professional collaboration as noted in the school's Accountability Plan, there is a need for frequent and sustained opportunities for teacher PLCs to collaborate during professional learning activities such as technology training, SRSD training, and work on common assessment as supported by the district. Each teacher has one preparation period a day. Currently, the grade 9 Engineering and Technology team has common planning time built into their schedule as part of their assigned duty. The goal, as we move toward the academy and neighborhood model, is to purposefully create and plan for these opportunities throughout the day.

With the addition of the Grade 9 academy, there will be increased opportunities to schedule common planning time for teachers who work with the same group of students. Additionally, with the creation of academic neighborhoods for core content classes for grades 10-12 there will be opportunities for grade-alike collaborative meetings by content area as well as by academic pairings (ELA and social studies, and math and science). The addition of collaborative spaces will provide places for these teachers to meet, something that is currently unavailable in the current building.

8) The information provided indicates that "a robotic salad machine" (page 65) will be incorporated into the project in order to provide "continued access to healthy snacks beyond the school day" (p. 65). In response to these review comments describe how the goal of providing access to healthy snacks could be met if the proposed machine were not available for incorporation into the proposed project. Clarify whether additional square footage, equipment, and/or staff would be required.

District Response: (DMHS/WPS) The faculty dining room will include a serving line adjacent to the kitchen, essentially providing the full range of cafeteria services and options through a reduced footprint. This includes a serving line and a point-of-sale station. This station can be operated by staff members, and can provide meal options to students beyond the school day.

The dimensions of the salad machine, including clearance, are 47 ¾" w x 46"d x 76 ½" h, requiring minimal space in the cafeteria. No additional space is needed if the machine were not available.

9) The information provided references a 2,000 square foot space "to house 8 individual work- stations for the Support Specialists" (p. 71). In response to these review comments please confirm whether these support specialists are dedicated to the Doherty Memorial High School and/or whether any of them support District-wide technology needs.

District Response: (DMHS/WPS) The Support Specialist work-stations serviced both Doherty and district-wide technology needs. Each school is assigned a Support Specialist, and so Doherty's Support Specialist would be allocated a workstation in this space in which to work. The conference set-up and additional work-stations support district-wide needs.

While not all staff are dedicated exclusively to Doherty Memorial High School, the Support Specialists will have a role within our vocational programming.

With the inclusion of the Programming and Web Development Vocational Program, Doherty plans to utilize this combined IT space collaboratively with the Support Specialists. Students will be able to work with Support Specialists to engage with their curriculum through real-world applications. Upper-class students will have opportunities to complete their co-op or internships in-house alongside the working members of the IT department.

The information provided references "an open-concept conference set-up" that could be used to "enable Support Specialists and IT staff from across the District to have a collaborative workspace" (p. 71). While the MSBA does not object to the District *providing District-wide IT space in the proposed project, any such spaces will be considered ineligible for reimbursement. Please acknowledge.*

District Response: Acknowledged. As explained in the education plan, Doherty does view this partnership as a critical component within our proposed vocational programming.

10) The information provided references a maker space adjacent to the Media Center. In response to these review comments, provide additional information about how the proposed maker space will be staffed, scheduled and maintained. Additionally, refer to the MSBA's guidelines for STEAM and maker spaces.

District Response: (DMHS) The maker space will be staffed by the school Media Specialist. The Media Specialist will be responsible for maintaining the schedule and coordinating logistics as needed. This central resource will be available to all teachers from all departments.

The new school design, due to the ninth-grade academy model as well as clustered neighborhoods and pairings of the core academic spaces in grades 10-12, will benefit from the maker space. In the current Engineering and Technology Academy, Doherty's students complete the Learning Fair interdisciplinary project (p. 75). As explained in the PDP (p. 76-77), the maker space would allow this excellent practice to expand.

> *Outside of the teamed ETA, integrated learning is relatively new for many students and staff. This is mainly due to a lack of space for common planning and for interdisciplinary planning, existing space and technology limitations, and the lack of much needed adjacencies between and among various departments. Often, teachers within their individual classes will design learning activities that incorporate multiple domains of learning and that span content areas, but there are challenges to implementing true cross-disciplinary work that brings multiple classes and content educators together. (PDP Teaching Philosophy Statement, p. 76)*

11) The information provided references "additional collaborative space," "common areas within sightline of classrooms," and "an interior community space beyond the classroom" (p. 78). In response to these review comments, describe the scale, required adjacencies, architectural characteristics, and anticipated users for such spaces. Additionally, describe how these spaces will be scheduled and overseen and clarify whether the spaces referenced are envisioned as the same space, or as three separate spaces.

District Response: (DMHS) These descriptors reference the same space, designated on the space summary as the "Common Rooms". Doherty envisions a flexible space to provide for multiple orientations and uses, with flexible furnishings to account for current and future needs. These are multipurpose spaces for the benefit of all departments.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

The information provided calls for outdoor workspaces adjacent to art classrooms. Ensure that any outdoor spaces provided are fully accessible to users with mobility impairments.

District Response: Acknowledged.

12) The information provided describes a black box/multi-purpose/performing arts classroom. Provide the anticipated seating capacity of this space as well as scheduling information that indicates how the space will complement, rather than duplicate, the anticipated uses of the proposed 750-seat Auditorium. The MSBA encourages the design team to explore potential efficiencies between these two proposed performance/lecture spaces. Please acknowledge.

District Response Acknowledged. This item will be further addressed within the PSR.

During the numerous school- and community-based visioning sessions, the groups consistently identified as a priority a need for a variety of performance venues for class, school and community use. As explained in the PDP (p. 82), the Massachusetts Arts Curriculum Frameworks outlines standards that enable students to engage in a range of learning activities.

Doherty is anticipating that the Black Box 90-100 seat multi-purpose space to accommodate these school and community needs.

The Black Box will be a flexible performance space with appropriate acoustics, flexible seating and adjustable lighting. In addition to use by the technical theater program for practice and performances, this space will be used as a more intimate practice and performance space for band and chorus ensembles, as a location to showcase or present projects from all departments, and for "Coffee House" events. As performing arts classes run simultaneously with extracurricular activities such as theatrical productions or housing guest speakers, Doherty will require varied and flexible options based on the class and/or organization's need.

The information provided references a maker space in the performing arts area of the school. In response to these review comments provide further information about how this space will be staffed, scheduled and maintained. Additionally, describe the anticipated functions of this space that could not be met in a performing arts classroom or the maker space adjacent to the Media Center.

District Response: The new school design calls for a maker space in proximity to the performing arts area, including the auditorium stage. A survey of students indicated interest in increased opportunities within the theater department. This expansion would include additional course offerings and performance opportunities. The Massachusetts Art Frameworks include opportunities for students to develop and refine techniques and work for presentation (T.T.P. 06). This includes providing opportunities for students to lead and organize the production of technical elements of a production such as scenic, lighting, props, costumes, sound, or makeup design. A makerspace adjacent to the arts space would support such student work which is not appropriate for a general education/performing arts classroom, given the tools and equipment needed and the nature of this messy work. Once constructed, these sets will remain in place for an extended period of time allowing for performing arts students to refine their design and construction skills and to refine and complete artistic work (A.C.T.Cr. 03).

Additionally, Doherty envisions this space to be used by performing arts classes and extracurricular groups, e.g. for the musical, the theater club, the art club, etc.. Currently, Doherty's performing arts classes and extracurricular organizations offer multiple theatrical productions throughout the year. Each of these requires set design and construction. Even after the sets are built, they remain built for lengthy period of time until the performance(s) is/are completed. Doherty classes and clubs build sets on the stage itself as there is no additional space available. This prevents the stage from being used by any other class, limits the use of the stage for group assemblies/presentations, or from any outside organization from using the space, during that time. The auditorium and stage are regularly limited or not available for general teacher use. During the 2019-2020 school year, due to overcrowding, several classes have been assigned in the auditorium. Numerous repeated comments made during visioning sessions noted the need for multiple performing arts spaces. Building/keeping sets on the stage in the auditorium would limit the performing arts space that is available for the school throughout the year.

13) The information provided identifies dance and choreography as two of many uses anticipated for Physical Education space in the proposed project. Describe any provisions that will be made to support these functions, for example, providing a spring floor.

District Response: (DMHS) There are no specialized provisions envisioned for these Physical Education spaces. Rather, they will provide options for the school's various athletic teams and extracurricular groups more appropriate space for a wide range of work and activities. Currently, some teams or groups practice or work in hallways or crowded areas.

14) The information provided indicates that the District is in the process of moving to a *"more inclusive model" of instruction (p. 97). In response to these review comments, describe the steps the District has taken/is currently taking/will take to support this shift.*

District Response:

The District has taken steps to support the shift to a more inclusive model of instruction. There have been several professional learning opportunities geared toward supporting the success for all students, particularly focused on the delivery of curriculum, instruction, and interventions. Training has been provided at the district and school levels to effectively meet the needs of our Special Education students. The exchange of effective strategies and practices among and between general education teachers and special education teachers is invaluable to inform their co-teaching. The district is committed to continuing to provide training to support the successful implementation of all Individualized Education Plans and to provide the necessary staff to support all Special Education programming including but not limited to inclusion specialists, behavioral specialists, and paraprofessionals necessary to remain within the regulations that govern Special Education in Massachusetts and to educate all students in the Least Restrictive Environment, (LRE).

15b) The information provided indicates that Doherty Memorial High School houses one existing approved Chapter 74 program (Engineering & Technology) and that three additional Chapter 74 programs (Programming & Web Development, Marketing Management & Finance, Construction Craft Laborer) are proposed for the new facility. Additionally, the current facility houses one existing non-Chapter 74 vocational program (Television Production) which the District intends to continue in the new facility. (No response required).

District Response: No response required.

It is unclear from the information provided whether the existing Computer Science offerings, which appear to be part of the Mathematics Department, are intended to remain within that

department or whether they are envisioned as an additional, stand-alone non-Chapter 74 vocational program in the new facility. Please clarify.

District Response: The Computer Science course offerings are non-CVTE electives. The Vocational Programming and Web Development program teachers will be organized within the larger CVTE department, and not within the Computer Science and/or Mathematics department(s).

Currently, Computer Science classes are sometimes taught by Mathematics teachers, as these staff members tended to have skill sets and/or licensures in both areas. However, the Mathematics Curriculum Framework (2017), as well as the Digital Literacy and Computer Science Curriculum Framework (2016) are distinct curricula and with the coming inclusion of Computer Science as a graduation requirement, coupled with its growing popularity, DMHS may choose to group the Computer Science teachers into their own department.

The information provided indicates that the Engineering and Technology Academy program will include laboratory spaces with a variety of manufacturing and fabrication equipment. In response to these review comments, confirm that adequate ventilation will be provided, and that appropriate safety measures will also be provided/accounted for. Similarly, confirm that adequate ventilation and appropriate safety measures will be provided for the Construction Craft Labor program's laboratory spaces. Please acknowledge.

District Response: Acknowledged.

18) The information provided notes that "[t]he WPS has standardized district-wide… use of Genetec for video surveillance as well as AXIS brand surveillance cameras" in order to streamline and reduce costs for staff training and maintenance. Similarly, the District uses a single vendor (Shoretel/Mitel) for its voice-over-ip phone system and phones. The MSBA notes that the District will need to provide proprietary specifications information for these products in its Schematic Design submission. Please acknowledge.

District Response: Acknowledged.

19) In response to these review comments clarify why proximity to the World Languages program is not a goal for the District's English Language Learners program.

District Response: (DMHS) The Equal Educational Opportunities Act of 1974 (EEOA) and Title VI of the Civil Rights Act of 1964 require that schools have both equal and meaningful participation in educational programs. The close proximity to the core academic classrooms/neighbors will support language acquisition in core content areas, provide equal access to core academic classes and resources which allows for collaboration with core academic teachers and classes, and supports EL students in core academic classes.

Doherty wants the English Language Learners program to be closer to the core academics so that students and staff are continuously involved and integrated into these core academic spaces.

No further review comments for this section.

3.1.3 INITIAL SPACE SUMMARY

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Space summary; one per approved design enrollment	☐	☒	☐	☐
2	Floor plans of the existing facility	☒	☐	☐	☐
3	Narrative description of reasons for all variances (if any) between proposed net and gross areas as compared to MSBA guidelines	☒	☐	☐	☐

MSBA Review Comments:

1) The MSBA has performed an initial review of the space summary and offers the following:

- ***General notes regarding the submitted space summary*** *– Storage spaces in excess of MSBA guidelines are typically considered as gross area included in the grossing factor. In future submittals carry spaces typically defined as gross area (including unoccupied rooms, toilet rooms, unoccupied closets, supply rooms and storage rooms) within the grossing factor, not as net area, unless the MSBA space summary template specifically includes that space in the net area category. MSBA notes that the proposed total gross area cannot exceed the maximum allowable factor of 1.5 of* *net area.*

District Response: Acknowledged. This item will be addressed within the PSR.

- ***Core Academic*** *– The overall proposed square footage for this category appears to exceed the MSBA guidelines by 23,440 net square feet ("nsf"). Per the information provided, the following spaces will be proposed in order for the District to deliver its educational program:*

Anticipated Core Academic Spaces	***Grades 9-12; 1,670 students***		
	Proposed No. Rooms	*MSBA Guidelines No. Rooms*	*Variance*
General Classrooms	*57*	*56*	*+1*
Teacher Planning	*48*	*56*	*-8*
Department/Book Storage	*9*	*0*	*+9*
Small Group Seminar	*9*	*4*	*+5*
*AVID Classroom**	*1*	*0*	*+1*
Science Classroom/Lab	*16*	*15*	*+1*
Prep Room	*16*	*15*	*+1*
Central Chemical Storage Room	*1*	*1*	*-*
*Small Group Room (ELL)**	*4*	*0*	*+4*
*Language Lab**	*2*	*0*	*+2*
*Large Group Seminar Room**	*1*	*0*	*+1*
*Computer Science Classrooms**	*3*	*0*	*+3*

**The MSBA will rely on the District's Educational Program and additional information provided to understand how proposed spaces that are unique to the District will be utilized in the proposed project.*

The MSBA notes that the proposed project has a utilization of approximately 69%, including

(80) capacity-generating spaces in this category. The MSBA encourages the District to seek opportunities to increase the utilization of the proposed project. In order to consider a proposed project with an overall utilization lower than 85%, the MSBA needs to better understand the proposed schedule and intended use of general classrooms, science labs and specialty classrooms. In response to these review comments, please provide detailed scheduling and utilization information substantiating the need for the proposed number of classrooms and labs.

District Response: In the PDP statement, Doherty calculated the room utilization rates for each department, for general and special education, and for the school. In this calculation, we considered every space available, even those classrooms that provide instruction through an open-concept approach. For example, one of our classrooms (room 212) is subdivided into three spaces (212A, 212B, 212C) even though all are within the same class area. This subdivision of additional classroom space is due to the severe overcrowding within the current building.

Worcester is planning for a building with a larger enrollment – 1,670. This enrollment figure was based on demographic trends, as well as the recognition that Doherty has one vocational program. Since then, Doherty has proposed the inclusion of three additional vocational programs, as well as an advanced academy, that would be open to students from across the district. In addition, when compared to other schools, Doherty is currently understaffed for its student population. Doherty is unable to grow current programming due to lack of space; average class sizes, counselor ratios, etc. are comparatively high; and many classrooms are inadequately sized and provisioned. When planning for the new school, Doherty's proposal seeks to remedy these issues by offering additional programming, hiring additional staff, ensuring all classes – general and special education – are taught in appropriately sized classroom, etc. Currently, there are many special education students who receive a range of services, as well as are included within the general education classroom(s) to varying degrees. Each year, the numbers of students in full or partial inclusion change. The Space Summary template as well as the adjacency diagrams included within the PDP demonstrate the flexible orientations that will be possible as special education classrooms are integrated into the core academic spaces.

Within the current space, there are 76 total classroom spaces, albeit several rooms are really subdivided spaces within a single classroom space. Of these 76 rooms, 9 are designated as SPED spaces. 67 therefore are general education spaces, which includes science, health and physical education, art, CVTE programming, and core and elective programming. During the 2018-2019 school year, these spaces had a 94.7% utilization rate, and this was based on a maximum population of 1,529 students.

The student population is expected to increase by approximately 150-180 students. As each student needs 7 classes per day, this translates to, at a minimum, an additional 42 instructional periods of core and elective instruction (150 students x 7 periods ÷ 25 students per section). 42 instructional periods correlates to 6 full classroom spaces (42 spaces ÷ 7 periods) at a minimum. As we understand the MSBA space summary template, there are 80 non-SPED capacity generating spaces. With the increased student population and commensurate increase in course offerings, Doherty estimates the room utilization rate as follows:

During the 2018-2019 school year:

67 general education classroom spaces
7 periods of potential utilization; 67 x 7 = 469 instructional periods available
utilization rate of 94.7% = 444 instructional periods taught within the general education classroom spaces

Within the PDP proposal for the new building:

80 general education classroom or capacity generating spaces proposed
7 periods of potential utilization; 80 x 7 = 560 instructional periods available
If we assume current scheduling (444 instructional periods) and factor in the minimum addition of 42 instructional periods, then the total minimum instructional periods being run will be 486
This creates a utilization rate within the general education spaces of approximately 86.7% (486 ÷ 560). In reality, there will likely be more than 42 additional periods created due to the increased population, and each additional period will increase the school's room utilization rate.

Please incorporate the proposed "Department/Book Storage" areas into the grossing square footage. No further preliminary comments.

District Response: This item will be addressed within the PSR.

- ***Special Education** – Please note that the Special Education program is subject to approval by the Department of Elementary and Secondary Education ("DESE"). The District should provide the required information required with the Schematic Design submittal. Formal approval of the District's proposed Special Education program by the DESE is a prerequisite for executing a Project Funding Agreement with the MSBA.*

This category includes twelve (12) Inclusion SPED rooms at 900 nsf each. Please clarify the function and anticipated distribution of these spaces and describe their desired architectural character, furnishings and equipment.

The information provided proposes a 3,000 nsf Adaptive PE space. Describe the District's approach to identifying this proposed square footage, and verify that the proposed square footage will be dedicated exclusively to students receiving special education services.

District Response: As the district continues to move toward a more inclusive model, the special education classrooms and spaces will be integrated into the core academic spaces. This model will allow for flexibility as the numbers of students receiving full inclusions or partial inclusion services change.

Doherty has planned for four Grade 9 interdisciplinary teams with one special education inclusion classroom and one resource space integrated into each team.

Additionally, Doherty is planning to establish academic neighborhoods for core content classes for grades 10–12. With core departmental pairings, such as Mathematics and Science, or Social Studies and English Language Arts for example, the school seeks two inclusion special education classroom and one resource classroom space to be integrated within each department as well. These Special Education classrooms will be distributed throughout the academic areas.

Doherty envisions a flexible space to provide for multiple orientations and uses, with flexible furnishings to account for current and future needs.
Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

The Adaptive PE space will be utilized by students receiving special education services. As the program grows, the school hopes to establish and strengthen its unified programming options, thus providing additional opportunities for special and general education students to collaborate.
As the SD process continues, the committee will be designing and including additional information for review.

- ***Art & Music** – The overall proposed square footage for this category appears to exceed the MSBA guidelines by 3,850 nsf. Much of this overage results from the inclusion of (1) 1,200 Digital Arts Lab, (1) 900 nsf Piano Lab, (1) 900 nsf General Music Classroom and (1) 400 nsf Teacher Planning space. Please note that area beyond that included in the guidelines will be deemed ineligible for reimbursement.*

District Response: Acknowledged. Doherty understands that these spaces exceed MSBA guidelines and are above and beyond the allotments within the template. However, the school's scheduling challenges, wait lists for programming, and student interest demonstrates the need for such space. Recent expansion of our visual arts program has added an additional art teacher allowing the school to plan to expand the current visual art courses to meet student interest and to alleviate the need for wait lists for art courses. However, more specific art space is needed for all students to access the arts curriculum as indicated in the Massachusetts Arts Frameworks. A dedicated Visual Arts lab will allow students to refine and complete artistic work by incorporating new materials, constrains, genres, or styles as noted in the Massachusetts Arts Frameworks (P.V.Cr.03) and will support students in advanced classes , such as Advanced Placement Studio Drawing, to support work on their digital art portfolio. Additionally, this will allow the opportunity to offer art courses such as graphic art, digital media art, and digital photography to support student interest and to prepare students to appreciate and create digital art and allow for cross-curricular sharing with such programs as Marketing as students in both classes collaborate on projects such as visual displays for the school store.

A dedicated piano lab, staffed by the music teachers, will allow for individualized attention to students and differentiation of music instruction, providing support for music students at all levels. Students will be afforded the opportunity to study piano, something that is not possible for many students outside of school for financial reasons. Additionally, a dedicated piano lab will afford students with the opportunity to explore and create original music compositions as noted in the Massachusetts Arts Curriculum Frameworks (A.T.P.05) as well as to develop and refine artistic techniques and work for presentation (ASE.M.P.05). Between the music classes, both instrumental and theory, this lab would be utilized consistently throughout the day. Its adjacency to the music classrooms would allow for easy access for music teachers to bring their classes to the lab and to have visual access for supervision of individual students using the lab or practice and/or composition. This lab will help to support music skills and allow for cross-curricular sharing with the theater department as the two departments collaborate to provide instruction in musical theater both during and after the school day.

The dedicated teacher planning space will allow for collaboration among music, art, and theater teachers to support student work and collaborative projects in the arts. Production meetings as well as individual auditions can be held in this space.

Currently, Doherty staff's two full–time music teachers as well as one full–time theater arts teacher. All programs are full and wait–listed students are consistently looking for opportunities to join. In addition, the school infrastructure and classroom space currently limit the course offerings. Doherty intends to expand the teaching staff within the new building to better meet the needs of students in offering additional and more varied music and performing arts classes. As the program grows, there will be increased opportunities for teachers within the two departments–Theater Arts and Music–to collaborate.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

- ***Vocations & Technology*** *– The overall proposed square footage for this category exceeds the MSBA guidelines by 10,870 nsf. The District is proposing to continue its Engineering program and is currently seeking Chapter 74 approval for three (3) programs: Programming & Web Development, Marketing Management & Finance, and Construction Craft Laborer.*

The MSBA notes the following:

  - *Engineering & Technology includes three shop areas totaling 7,500 nsf, four related classrooms, and four teacher offices. Describe how these spaces support the proposed program capacity of 400 students and the proposed schedule for students participating in the program.*
  - *Programming & Web Development includes four classrooms, and two teacher offices. Describe how these spaces support the proposed program capacity of 200 students and the proposed schedule for students participating in the program.*
  - *Marketing Management & Finance includes a 1,000 nsf school store, three classrooms, and two teacher offices. Describe how these spaces support the proposed program capacity of 200 students and the proposed schedule for students participating in the program. In order for the MSBA to consider all or a portion of the school store eligible for reimbursement the following additional information is required: proposed use of the space, how often Chapter 74 students will use the space as part of the curriculum, and the rationale for the proposed size of the space.*
  - *Construction Craft Laborer includes one 5,000 nsf shop area, two related classrooms, and two teacher offices. Describe how these*

spaces support the proposed program capacity of 150 students and the proposed schedule for students participating in the program.

In response to these review comments, and for each of the Chapter 74 Programs proposed, describe the number of students that will be in program space at a given time and provide the estimated utilization of the proposed spaces. Additionally, describe how minimum ceiling height requirements may affect how various shops are grouped and strategies to contribute to a more cost-effective facility.

District Response: (DMHS/WPS)

Engineering and Technology:

The Engineering and Technology Academy (ETA) consists of a 9th and 10th grade interdisciplinary teams. These teams integrate the vocational Engineering course with Mathematics, Science, History, and English. Given the team nature in that students share the same teachers and given that the staff integrate their academic programs to mutually support each other, students are engaging with the vocational curriculum during their Engineering, Mathematics, and Science classes within this program.

Doherty's schedule includes a 7-period day. Students in the ETA share 5 common classes together, which includes three vocational periods (out of 7) each day. Teachers, including vocational teachers, have 5 instructional classes each day, with a combined maximum student load of 125 students, per the Worcester Public Schools' contract. Due to safety considerations, some classes-including the Engineering classes-are capped so that their enrollment allows for safe access and utilization of the related shop areas. For example, all 9th grade ETA teachers have a maximum load of 100 students (5 classes x 20 students, as 20 is the maximum allowed within this vocation). Thus, at any given time there would be a maximum of 20 students working within any of the vocational or classroom spaces. Combined, there are 100 possible ETA students within each grade for a total of 400 students.

For example, a traditional ninth grade schedule would appear as follows:

Period 1 – English I

Period 2 – Geometry (integrated academics)

Period 3 – Biology (integrated academics)

Period 4 – Introduction to Engineering (vocational)

Period 5 – World History II

Period 6 – World Language

Period 7 – Health, Physical Education

During the school day, Engineering classes run simultaneously for grades 9–12. This results in 2–4 vocational classes running simultaneously during each period of the school day. Given the highly technical nature of the vocational curriculum, students are often accessing the classroom spaces– which would include computers, graphic design software, curriculum resources etc.– along with the vocational spaces each day.

The Engineering and Technology program's design includes three shop areas. These represent separate, albeit spatially adjacent and accessible, spaces in which different aspects of the vocational curriculum can be implemented. For example, Doherty currently has two–very undersized–shop areas. One houses typical construction and fabrication equipment, used primarily for wood–based projects, including a range of power tools, saws, sanders, drills, etc. The second shop area houses equipment such as 3D printers and fine milling machines. A third major component of the engineering curriculum includes electrical work, including analog and digital circuitry analysis, robotics, programmable logic controllers, etc. Currently, most of this work occurs in a classroom, but this requires staff to reorganize their space when this equipment is needed, e.g. moving computers to the side, setting up equipment, breaking it down each day to account for other classes coming into the space, etc.

The three shop areas would allow for dedicated spaces for the three currently designed major vocational skill sets. As industry standards and technologies change in the coming decades, these spaces provide flexibility in the school's ability to deliver the curriculum to such a large population.

Doherty is currently seeking Chapter 74 approval for three programs: Programming and Web Development; Marketing, Management and Finance; and Construction Craft Laborer. For each, Doherty has begun to lay the foundation by offering introductory coursework within the curriculum. Doherty intends to add additional coursework and staff to the maximum extent possible so that each program is established as we then transition to the new space.

The three proposed programs will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in each program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed. The table below shows likely course offerings at each grade level.

Sample Student Schedule:

	Grade 9	Grade 10	Grade 11	Grade 12
CVTE Curriculum	Grade 9 CVTE	Grade 10 CVTE	Grade 11 CVTE	Grade 12 CVTE

CVTE Related Theory (RT)	Grade 9 RT	Grade 10 RT	Grade 11 RT	Grade 12 RT
English	English I	English II	English III	English IV
Mathematics	Algebra	Geometry	Algebra II	Pre-Calculus
Science	Biology	Chemistry	Human Anatomy	Physics
World Language (assume that student needs at least 2 years to be college ready)	Language 1	Language 2 (at minimum, need to start the 2 year sequence in grade 10)	Language 3 (possible)	
Social Studies	World History II	US History I	US History II	
Credit total	7 credits (full schedule)	7 credits (full schedule)	7 credits (full schedule)	5 credits
Additional elective offerings				
Art/Music/ Computer Science/ Theater, other 1 credit electives	None available (unless move language to year 2)	None available	None available	Possible options

AP Classes	AP Human Geography not available (unless move language to year 2)	AP Human Geography, AP Statistics	Some options of an AP class in lieu of their core academic requirement (e.g. AP English Language for English III).	More options available

The Worcester Public Schools anticipates hiring four new teachers to serve all students within each Chapter 74 program. This will correspond to 1 teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for each program by offering introductory courses.

Given Doherty's expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of 'shop' time followed by another period of related theory supporting the curriculum. This will correlate to one teacher per grade.

At full enrollment, Doherty will offer 4 years of vocational instruction. As an example, below shows a potential teacher schedule within this vocational program and how the space will be utilized. Each teacher will have 2 sections of their respective vocational and related theory courses.

Sample Teacher Schedule (at Year 4)

	Grade 9	Grade 10	Grade 11	Grade 12

Period 1	CVTE Curriculum (sec 1)	CVTE Curriculum (sec 1)	Additional Course	CVTE Curriculum (sec 1)
Period 2	RT (sec 1)	RT (sec 1)		RT (sec 1)
Period 3	Common Planning Time	Common Planning Time	Common Planning Time	Common Planning Time
Period 4	CVTE Curriculum (sec 2)		CVTE Curriculum (sec 1)	CVTE Curriculum (sec 2)
Period 5	RT (sec 2)	CVTE Curriculum (sec 2)	RT (sec 1)	RT (sec 2)
Period 6		RT (sec 2)	CVTE Curriculum (sec 2)	Additional Course
Period 7	Additional Course	Additional Course	RT (sec 2)	

Programming and Web Development:

The Programming and Web Development program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Programming 1 and Related Theory 1, and a 10th grade student will enroll in Programming 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 – English III
Period 2 – Pre–Calculus
Period 3 – AP US History
Period 4 – Programming and Web Development 3
Period 5 – Prog. and Web Dev. Related Theory 3
Period 6 – World Language
Period 7 – AP Physics 1

The Programming and Web Development program proposal seeks four classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers.

Marketing, Management and Finance:

The Marketing, Management and Finance program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Accounting 1 and Related Theory 1, and a 10th grade student will enroll in Marketing and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 10th grade schedule would appear as follows:

Period 1 – English II

Period 2 – Geometry

Period 3 – US History 1

Period 4 – Marketing I

Period 5 – Marketing Related Theory 2

Period 6 – World Language

Period 7 – Chemistry

The Marketing, Management and Finance program proposal seeks three classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers. With the inclusion of the school store, students will be able to share the classroom spaces with the store as an extension of their shop space. In addition, students will benefit from shared spaces within the Visual Arts department, for example as they design displays within their Marketing classes. The store will provide a space to account for many school needs, and students will be able to coordinate and supply these needs. For example, the store will provide a venue to offer school-branded merchandise for students, families, and community members. This will provide real-world opportunities to apply their vocational skills as they design the products and related advertising, as well as have opportunities to interact with peers and adults in a professional atmosphere.

Construction Craft Laborer:

The Construction Craft Laborer program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Construction 1 and Related Theory 1, and a 10th grade student will enroll in

Construction 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 – English III

Period 2 – Pre-Calculus

Period 3 – US History 2

Period 4 – Construction 3

Period 5 – CCL Related Theory 3

Period 6 – World Language

Period 7 – Physics

The Construction Craft Laborer program proposal seeks two classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers. In addition, the shop area will enable students to transfer theory to practice within this versatile space. As explained in the PDP (p. 107-108), there are little to no redundancy programs within Doherty and so this shop space will enable all necessary skill sets to be introduced and mastered.

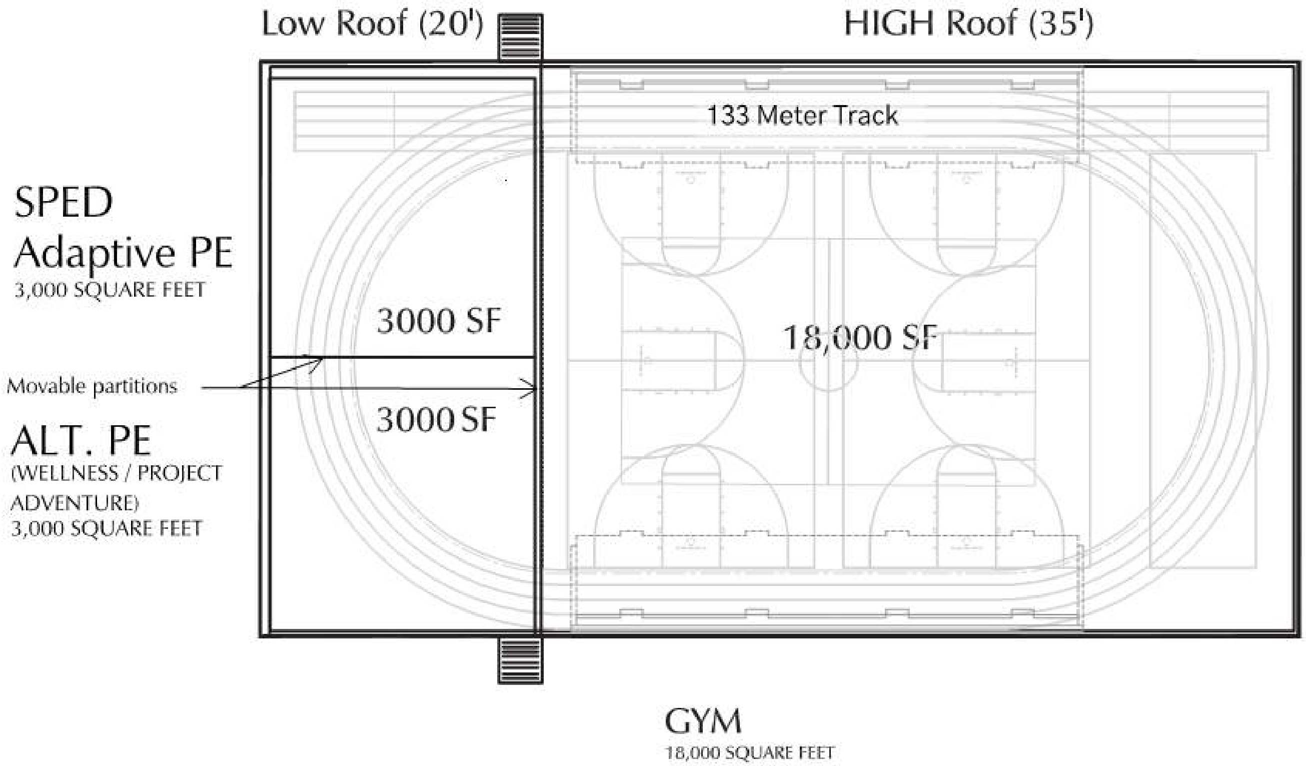
The Construction Craft Labor is the only program proposed that requires a shop ceiling height greater than a typical classroom. Layout efficiency will be considered when locating this shop within the building.

- ***Health & Physical Education*** *– The overall proposed square footage for this category appears to exceed the MSBA guidelines by 12,300 nsf.*
    - *Based on the design enrollment and class schedule, the MSBA accepts two*

additional 3,000 nsf physical education stations, totaling 6,000 nsf for an adjusted area of 31,552 allowed in this category. The proposed program is 300 nsf in excess of the adjusted guidelines.

- *The MSBA does not object to the District including this additional area in the proposed project, however all area in excess of the adjusted guidelines will be ineligible for reimbursement.*
- *Please refer to the attached memo regarding the MSBA's policy on physical education square footage in excess of the MSBA guidelines. Note that areas in excess of the MSBA guidelines will be the sole expense of the District; that community support must be demonstrated prior to MSBA approval of the District's proposed project scope and budget; and that the MSBA will exclude from its grant the cost of the total gross square footage ("gsf") in excess of the guidelines for these areas. In no event will the MSBA participate in a new construction project that includes contiguous gymnasium space exceeding 18,000 nsf. Please acknowledge.*

District Response: The district acknowledges the MSBA policy on physical education areas. The 3,000 sf wellness center and the adaptive PE spaces are planned to be adjacent to the 18,000 SF Gymnasium, separated by modular partitions with a lower 20' ceiling. The spaces are organized to support the day-to-day Physical Education program needs within the area allotted by the MSBA. After school hours, the modular partitions may be opened to accommodate a 133-meter indoor track for



track practice, for unified sports and for maximum flexibility for the overall school.

The information provided proposes a Gym/Community Storeroom (1,000 nsf). In response to these review comments provide information about how this space will be used and how this use will support the Educational Program; the MSBA will review the information provided to determine the inclusion and possible eligibility of this space.

District Response: The physical education curriculum throughout the year allows students to explore different athletic and wellness-based activities. Students will engage with these activities, many of which will utilize age-appropriate or industry-standard equipment. When not in use, to ensure safe storage to prevent damage, as well as to provide an uncluttered space for student safety, this storeroom is critical to provide for an effective Health and Physical Education experience for all students.

No further preliminary comments.

- ***Media Center** – The overall proposed square footage for this category appears to exceed the MSBA guidelines by 863 nsf. The MSBA encourages the District to attempt to find efficiencies in the proposed layout to reduce the overall net square footage. Please note that the MSBA will participate in area up to that included within the guidelines.*

Additionally, provide scheduling and anticipated use for the proposed Social Emotional Learning Center and describe the logic for locating this space within the Media Center. No further preliminary comments.

District Response: Acknowledged.

The Social Emotional Learning Center is referring to the school coping room. As explained in the PDP statement (p. 100), this is a space for students removed from their classroom for a portion of the day. The coping room is a space where students can receive academic and social and emotional support. To be assigned to the coping room, students would have received a referral from an administrator for a certain amount of time. Students would complete academic tasks while also receiving the social-emotional support needed to successfully transition and return to their regularly assigned schedule of classes.

It is not critical for this space to be adjacent to the Media Center.

- ***Auditorium/Drama** – The overall proposed square footage for this category appears to exceed the MSBA guidelines by 7,100 nsf. This excess is due to the inclusion of a Theater Classroom, Black Box Theater and Performing Arts Maker Space as well as an Auditorium, Stage, Greenroom and Control Room that are larger than indicated by guidelines. Note that square footage in excess of the guidelines will be considered ineligible for reimbursement. Please refer to the memo referenced above regarding MSBA's policy on auditoriums and square footage in excess of the MSBA guidelines. No further preliminary comments.*

District Response: Acknowledged. Refer to the response to question 12 above.

- ***Dining & Food Service** – The overall proposed square footage for this category appears to exceed the MSBA guidelines by 2,871 nsf. Much of this overage results from the inclusion of a substantially larger serving area and a larger kitchen than indicated in the guidelines. Additional overage results from the inclusion of a 200 nsf Satellite Grab n' Go station. The MSBA encourages the District to seek efficiencies in the proposed layout to reduce the overall net square footage and will continue to evaluate the eligibility of this additional space in future submittals. No further preliminary comments.*

District Response: Acknowledged.

- ***Medical** – The overall proposed square footage for this category appears to exceed the MSBA guidelines by 1,645 nsf. Much of this overage results from the inclusion of a School Based Health Center ("SBHC"), operated in partnership with the Worcester Public Schools by Family Health Center. The MSBA does not object to the District including this space in the proposed project, however space over guidelines will be considered ineligible for reimbursement. No further preliminary comments.*

District Response: Acknowledged.

- **Administration & Guidance** – The overall proposed square footage for this category appears to exceed the MSBA guidelines by 3,618 nsf. With exception of space dedicated to the School Resource Officer, area beyond that included in the guidelines will be deemed ineligible for reimbursement. The MSBA encourages the District to attempt to find efficiencies in the proposed layout to reduce the overall net square footage. Please note that the MSBA will participate in area up to that included within the guidelines. No further preliminary comments. This category includes one (1) Job Placement Office (Tech ED) at 150 nsf. Clarify the students that this space is intended to serve. If only Chapter 74 students are served by this space, please reallocate to the Vocations & Technology category above. Additionally, please reallocate any other spaces that exclusively serve Chapter 74 students to the Vocations & Technology category.

District Response: (DMHS) Currently, many Doherty students participate in work-experience or internship placements. Doherty offers several credit-earning options for non-vocational students and so this space is not intended exclusively for the Chapter 74 programs. For example, the SITE program (Students Involved in Their Education) allows students to leave school at the end of the day to participate in an unpaid internship within a local business or organization. Students with a job who complete certain requirements are eligible to earn credit and many of them work to help to support their families. The Job Placement Office established a common location for students, staff and community members to access information about these options and to utilize the support provided.

Students within the vocational programs participate in internship opportunities independent of the SITE or Work-Experience programs.

- ***Custodial & Maintenance*** *– The overall proposed square footage for this category appears to exceed the MSBA guidelines by 716 nsf. The MSBA encourages the District to attempt to find efficiencies in the proposed layout to reduce the overall net square footage. Please note that the MSBA will participate in area up to that included within the guidelines.*

The space summary provided calls for a Custodian's Storage (375 nsf), Storeroom (1,000 nsf), and Outdoor Equipment Storage (300 nsf). Please incorporate these proposed storage areas into the grossing square footage. No further comments.

District Response: Custodian's Storage (375 nsf) and Storeroom (935 nsf) are included in the MSBA Guidelines. This comment will be addressed in the PSR Space Summary.

- ***Other*** *– The information provided indicates that 4,500 nsf will be provided for Technical Services / IT. This space will, "include a server room, receiving and storage and offices for technical support space. The space will also act as a living lab for the Programming and Web Development Chapter 74 program. In the next submission, please fully describe the function, intended users and scheduling of each*

> *of the proposed Technical Services / IT spaces. Additionally, clarify whether the proposed space will exclusively serve the needs of Doherty Memorial High School or whether it will serve District-wide needs. Note that while the MSBA does not object to the inclusion of District-wide IT space in the proposed project, any such spaces will be considered ineligible for reimbursement. The MSBA will continue to evaluate eligibility of the remaining areas in subsequent submittals.*

District Response: (DMHS/WPS)

The 4,500 nsf Technical Services/IT space will be comprised of several areas, including a server/infrastructure space, receiving and storage, as well as the offices and work-spaces for the Support Specialists. The server and related infrastructure are to enable Doherty to access critical technological services.

The Support Specialist work-stations are expected to service both Doherty and district-wide technology needs. Each school is assigned a Support Specialist, and so Doherty's Support Specialist would be allocated this space in which to work. The conference set-up and additional work-stations support district-wide needs for the network engineer, administrators and Support Specialists.

While not all staff are dedicated exclusively to Doherty Memorial High School, the Support Specialists will have a role within our vocational programming.

With the inclusion of the Programming and Web Development Vocational Program, Doherty planned to utilize this combined IT space collaboratively with the Support Specialists. Students would be able to work with Support Specialists to engage with their curriculum through real-world applications. Upper-class students will have opportunities to complete their co-op or internships in-house alongside the working members of the IT department.

It is traditionally difficult to use high-school interns due to the commute time for interns to travel to the networking office. By housing the school networking infrastructure at Doherty interns from the vocational program would be able to work with IT during the school day as well as afterschool, thereby receiving real world experience troubleshooting issues as they occur. Students would gain experience in IP addressing, network troubleshooting wireless spectrum analysis, user account maintenance, and more.

Please note that upon selection of a preferred solution, the District may be required to adjust spaces/square footage that exceeds the MSBA guidelines and is not supported by the Educational Program provided.

District Response: Acknowledged

No further review comments for this section.

3.1.4 EVALUATION OF EXISTING CONDITIONS

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Confirmation of legal title to the property.	☒	☐	☐	☐
2	Determination that the property is available for development.	☐	☒	☐	☐
3	Existing historically significant features and any related effect on the project design and/or schedule.	☐	☒	☐	☐
4	Determination of any development restrictions that may apply.	☐	☒	☐	☐
5	Initial Evaluation of building code compliance for the existing facility.	☒	☐	☐	☐

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
6	Initial Evaluation of Architectural Access Board rules and regulations and their application to a potential project.	☒	☐	☐	☐
7	Preliminary evaluation of significant structural, environmental, geotechnical, or other physical conditions that may impact the cost and evaluations of alternatives.	☒	☐	☐	☐
8	Determination for need and schedule for soils exploration and geotechnical evaluation.	☒	☐	☐	☐
9	Environmental site assessments minimally consisting of a Phase I: Initial Site Investigation performed by a licensed site professional.	☐	☒	☐	☐
10	Assessment of the school for the presence of hazardous materials.	☒	☐	☐	☐
11	Previous existing building and/or site reports, studies, drawings, etc. provided by the district, if any.	☒	☐	☐	☐

MSBA Review Comments:

2) The information provided includes confirmation from the City of Worcester that the Doherty High School site is available for development. Similar confirmation is not provided for the Foley Stadium or Chandler Magnet School sites. Please provide as part of the District's Preferred Schematic Report.

District Response: This item will be addressed in the PSR submission.

3) As part of the District's Schematic Design submission include the timeline associated with filing with the Massachusetts Historical Commission ("MHC") and obtaining MHC approval prior to construction bids. The District should keep the MSBA informed of any decisions and/or proposed actions and should confirm that the proposed project is in conformance with Massachusetts General Law 950, CRM 71.00.

District Response: This item will be addressed in the SD submission.

4) The information provided includes development restrictions for the Doherty High School site and indicates that development restriction information for the Foley Stadium and Chandler Magnet School sites will be further explored during the Preferred Schematic Report phase of the project. Detailed information describing these *sites and the associated restrictions must be provided in the District's Preferred Schematic Report. Please acknowledge.*

District Response: Acknowledged.

9) The information provided indicates that the removal of an abandoned 275-gallon fuel oil above ground storage tank will be part of the proposed project. Note that all costs associated with the abatement of contaminated soil from any source, including abatement and removal of fuel storage tanks will be considered ineligible for MSBA reimbursement. Please acknowledge.

District Response: Acknowledged.

No further review comments for this section.

3.1.5 SITE DEVELOPMENT REQUIREMENTS

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	A narrative describing project requirements related to site development to be considered during the preliminary and final evaluation of alternatives.	☒	☐	☐	☐
2	Existing site plan(s)	☒	☐	☐	☐

MSBA Review Comments:

No review comments for this section.

3.1.6 PRELIMINARY EVALUATION OF ALTERNATIVES

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Analysis of school district student school assignment practices and available space in other schools in the district	☐	☒	☐	☐
2	Tuition agreement with adjacent school districts	☐	☒	☐	☐
3	Rental or acquisition of existing buildings that could be made available for school use	☒	☐	☐	☐
4	Code Upgrade option that includes repair of systems and/or scope required for purposes of code compliance; with no modification of existing spaces or their function	☒	☐	☐	☐
5	Renovation(s) and/or addition(s) of varying degrees to the existing building(s)	☒	☐	☐	☐
6	Construction of new building and the evaluation of potential locations	☐	☒	☐	☐
7	List of 3 distinct alternatives (including at least 1 renovation and/or addition option) are recommended for further development and evaluation.	☐	☒	☐	☐

MSBA Review Comments:

1,2) The information provided uses the phrase, "[t]he District has previously reported" when describing students school assignment practices and tuition agreements. In response to these review comments please clarify whether the previously reported information is still accurate.

District Response: There are no changes to the district's school assignment practices and tuition agreements.

6) The information provided uses the phrase, "[t]he District has previously reported" when describing evaluation of potential locations. In response to these review comments please clarify whether the previously reported information is still accurate.

District Response: The district's previously reported information regarding potential locations is accurate.

The information provided identifies two additional sites that may be suitable for the proposed project and that would "require land acquisition." Note that confirmation of full ownership, control and exclusive use will be required for the MSBA to execute a Project Funding Agreement with the District. Refer to the MSBA Project Advisory #45 "MSBA Requirements for Land Use" for more information. Please acknowledge.

District Response: Acknowledged.

The information provided for the new construction option on the existing Doherty Memorial HS site proposes an underground parking garage. The MSBA notes that all construction costs and soft costs (including associated Designer, OPM and commissioning consultant fees) associated with structure parking will be considered ineligible for reimbursement and must be itemized on the Total Project Budget spreadsheet included with the District's Schematic Design submission.

District Response: Acknowledged.

7) As part of the Preliminary Evaluation of Alternatives, the District explored six (6) options:

- ***Base Repair Option**: Code Upgrade at the existing Doherty Memorial High School with an estimated project cost of $81.7 million.*
- ***Renovation/Addition Option:** Renovation/Addition at the existing Doherty Memorial High School with an estimated project cost of $231 million.*
- ***Option A.1:** New Construction at the Doherty site with an estimated project cost of $241.7 million.*
- ***Option B.1:** New Construction at the Foley Stadium site with an estimated project cost of 240.7 million.*
- ***Option C.1:** New Construction at the Chandler Magnet School site with an estimated project cost of $222.6 million.*

- ***Option C.2:*** *New Construction at the Chandler Magnet School site with Added Land with an estimated project cost of $222.6 million plus associated land acquisition costs.*

Upon evaluation of the preliminary options, the District has chosen and intends to further evaluate the following five (5) options in the Preferred Schematic Report:

- ***Base Repair Option***
- ***Renovation/Addition Option***
- ***Option A.1***
- ***Option B.1***
- ***Option C.2***

Please note that the MSBA expects to receive information for each of the options identified above in the District's Preferred Schematic Report, as outlined in the MSBA's Module 3 – Feasibility Study Guidelines. When further considering potential options, note that the MSBA has supported, and will support and participate in, a Base Repair/Code Upgrade option that enables the District to deliver the critical components of its educational program. Should the District select a preferred schematic other than a Base Repair/Code Upgrade option, the District must continue to demonstrate estimated project cost for the Base Repair/Code Upgrade option for cost comparative purposes. This information must be provided in the Preferred Schematic Report submittal. Please acknowledge.

District Response: Acknowledged.

No further review comments for this section.

3.1.7 LOCAL ACTIONS AND APPROVAL

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Certified copies of the School Building Committee meeting notes showing specific submittal approval vote language and voting results, and a list of associated School Building Committee meeting dates, agenda, attendees and description of the presentation materials	☒	☐	☐	☐
2	Signed Local Actions and Approvals Certification(s):				
	a) Submittal approval certificate	☒	☐	☐	☐
	b) Grade reconfiguration and/or redistricting approval certificate (if applicable)	☐	☐	☐	☐

3	Provide the following items to document approval and public notification of school configuration changes associated with the proposed project				
	a) A description of the local process required to authorize a change to the existing grade configuration or redistricting in the district	☐	☐	☐	☐
	b) A list of associated public meeting dates, agenda, attendees and description of the presentation materials	☐	☐	☐	☐
	c) Certified copies of the governing body (e.g. School Building Committee) meeting notes showing specific grade reconfiguration and/or redistricting, vote language, and voting results if required locally	☐	☐	☐	☐
	d) A certification from the Superintendent stating the District's intent to implement a grade configuration or consolidate schools, as applicable. The certification must be signed by the Chief Executive Officer, Superintendent of Schools, and Chair of the School Committee	☐	☐	☐	☐

MSBA Review Comments:

No review comments for this section.

3.1.8 APPENDICES

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Current Statement of Interest	☒	☐	☐	☐
2	MSBA Board Action Letter including the invitation to conduct a Feasibility Study	☒	☐	☐	☐
3	Design Enrollment Certification	☒	☐	☐	☐

MSBA Review Comments:

No review comments for this section.

ADDITIONAL COMMENTS

Regarding past projects:

Both the MSBA's enabling legislation, M.G.L. c. 70B, and the MSBA's regulations, 963 CMR 2.00 et seq. specifically address the issue of past projects. MSBA records show a total MSBA payment of $2,846,485 for the Chandler Magnet School windows and doors replacement project (#201203480052) completed in August 2014.

Pursuant to these requirements and depending on the School District's ultimate plan for the *proposed project, the MSBA may recover a pro-rated portion of the financial assistance that the School District has received for previous renovation grants. The exact amount recovered will be established at the conclusion of the Schematic Design / Total Project Budget phase. Please see the MSBA website to view the MSBA's regulations, statute and closed school bulletin for additional information.*

District Response: Acknowledged.

End

3.3.1 INTRODUCTION

C. Updated Project Directory

OWNER

City of Worcester
City Manager's Office
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Worcester, MA 01608

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SCHOOL BUILDING COMMITTEE

Designation	Name and Title	Address
SBC member who is MCPPO certified	Jeremy Flansburg, DPW&P, Clerk of the Works	50 Skyline Drive Worcester, MA 01605
Local Chief Executive Officer & Administration/Manager	Edward Augustus, City Manager	455 Main Street Worcester, MA 01608
School Committee Member	Jack Foley WPS School Committee	20 Irving Street Worcester, MA 01609
Supt. of Schools	Maureen Binienda, WPS Superintendent	20 Irving Street Worcester, MA 01609
Deputy Supt. of Schools	Dr. Susan O'Neil WPS Deputy Supt.	20 Irving Street Worcester, MA 01609
Local Official Responsible for Building Maintenance	James Bedard, Director of Environmental Mgmt & Capital Projects	20 Irving Street Worcester, MA 01609
Rep. of Office authorized by law to construct schools bldgs.	Edward Augustus, City Manager	455 Main Street Worcester, MA 01608
School principal	Sally Maloney, Principal	299 Highland Street Worcester, MA 01602
Professional Engineer	K. Russell Adams, DPW&P, Asst. Commissioner	20 East Worcester Street Worcester, MA 01604
Local Budget Official or Member of Local Finance Committee	Thomas Zidelis City of Worcester Chief Financial Officer	455 Main Street Worcester, MA 01608
Other	Joseph Petty, Mayor City of Worcester Co-Chair SBC	455 Main Street Worcester, MA 01608
	Paul Moosey, DPW&P Commissioner, Co-Chair	20 East Worcester Street Worcester, MA 01604
	Brian A. Allen, WPS Chief Financial Officer	20 Irving Street Worcester, MA 01609
	Christina Kilday, Architect familiar with Public School Bldgs.	50 Skyline Drive Worcester, MA 01605
	Morris Bergman, City Councilor	455 Main Street Worcester, MA 01608

Designation	Name and Title	Address
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	Steve Bucciaglia, Teacher	38 Ireta Road Shrewsbury, MA 01545
	Katerina Kambosos, Teacher	84 Barry Road Worcester, MA 01609
	Renah Razzaq, Teacher	20 Healey Road Worcester, MA 01603
	M. Jesse Garcia, Techer	113 Grafton Street Millbury, MA 01527
	John Brissette, Parent/ Community Member	55 Amherst Street Worcester, MA 01602
	Rick Miller, Parent/ Community Member	23 Germain Street Worcester, MA 01602
	Brendan Melican, Parent/ Community Member	89 Olean Street Worcester, MA 01602
	Angela Plant, Parent/ Community Member	18 Chalmers Road Worcester, MA 01602

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3.3.2 EVALUATION OF EXISTING CONDITIONS

A. Narrative Summary
B. Supporting Documents

3.3.2 EVALUATION OF EXISTING CONDITIONS

A. Narrative Summary

Since the submission of the PDP in September 2019 there was further development of information, relative to the existing conditions, that will inform or impact the final evaluation of alternatives. This includes the following items:

- The City requested that the property lines for the Doherty Site, and the Alternate sites, Foley Stadium and Chandler Magnet school be advanced and marked in the field for the City, abutters and the interested advocacy groups review.
    - Doherty High school property line was researched and stakes set at the corners, the adjacent disc golf, exercise stations, pathways and other features were field located and shown on the base survey document published herein. The Park advocates have expressed concern, that the features noted are maintained, some are on land of the park, some on undeveloped land on the school parcel. Discussion on intent to maintain these features is covered in the site narrative discussion for option A-1.
    - For the Foley Stadium site, the City provided a recent survey and topographical document, and the property lines were reviewed, and are just outside of the existing fence surrounding the site.
    - For the Chandler Magnet site, the existing property line record survey, and other data from the City were used to mark the property lines in the field at the areas of the proposed work. This information is shown on the base survey document published herein.
- The City Solicitor has updated the Doherty High School property review memorandum that was published with the PDP, and is enclosed.
- For the alternate sites, in the PDP 3.1.4 A it was noted that further information on any restrictions would be reviewed, as these sites are not being forwarded for further study, no further information will be needed.
- Nitsch Engineering was requested as review the overall traffic at the Doherty and alternative sites, and is published herein. The City will need to address traffic concerns at the Foley Stadium Site, and the Chandler Magnet Site if those sites are selected. Likewise, at the Doherty High school site, pedestrian improvements are recommended.
- Lahlaf Geotechnical Consulting Inc. further reviewed the geotechnical data for the three sites, and their rapport is included, their findings were consistent with what was published in the PDP.

Below is a summary description of additional testing recommended for future phases:

- A geotechnical exploration program, including test pits/borings located the Doherty site as recommended by the geotechnical engineer and based on the District's Preferred Solution, is proposed during the SD phase. The soils in Worcester County have naturally occurring arsenic and the soils explorations will also include testing of the samples for arsenic content by the teams LSP, and recommendations will be made (the PDP included a few tests from the site) (this is similar as had been done for the earlier City projects)

- LPA|A recommends additional testing for hazardous materials at concealed and/or inaccessible locations, mastic damp-proofing at exterior cavity wall assemblies, roofing systems, that were not analyzed during the previous hazardous materials assessment. This work should be performed during the Design Development phase, when the Construction Manager is retained and can coordinate the logistics, repairs.

3.3.2 EVALUATION OF EXISTING CONDITIONS

B. Supporting Documents

1. Doherty Site – Existing Conditions Survey
2. Doherty Site – Deed Covenant Review
3. Foley Stadium Site – Existing Conditions Site Plan
4. Chandler Magnet Site – Existing Conditions Site Plan
5. Land Acquisition Process
6. All Sites – Proposed Geotechnical Exploration

3.3.2 B. Existing Conditions, Civil Engineering & Landscape

1.0 INTRODUCTION

Nitsch Engineering has prepared this Existing Conditions Site Evaluation Report as part of a Massachusetts School Building Authority (MSBA) Module 3 - Feasibility Study for the redevelopment of Doherty Memorial High School in Worcester, MA. The report corresponds to the MSBA Module 3 Preferred Schematic Report (PSR) and focuses on elements that relate specifically to the site development aspects of the Feasibility Study, referencing MSBA Section 3.3.2 F.2. Evaluation of Existing Conditions (Site).

2.0 EVALUATION OF EXISTING CONDITIONS

2.1 General

Nitsch Engineering conducted an existing site conditions assessment for the Doherty Memorial High School to evaluate site features and characteristics that may affect site redevelopment alternatives. The assessment was based on record information provided to us by the City of Worcester, presented in the City of Worcester's graphic information system (GIS) database, presented in the Massachusetts Geographic Information System (GIS), on information obtained by visual site observations made on May 22, 2019 and July 22, 2019 by Nitsch Engineering personnel, and on an on-the-ground topographic survey (draft) completed by Nitsch Engineering.

The information provided by the City of Worcester related to the project site included but is not limited to the following documents:

- A land acquisition plan of the parcel dated February 1961 (WCRD Book 254, Plan 72);
- A Commonwealth of Massachusetts Supreme Judicial Court Decree dated March 8, 1961 (WCRD Book 4178, Page 415) defining use of the parcel for a school, referencing the above noted plan;
- Municipal utility records; and
- Assessor's parcel data.

2.2 Physical Characteristics

Location and Configuration

The subject site (Site) is located at 299 Highland Street in Worcester, MA. The associated parcel is listed as Worcester Assessor's Office Parcel Number 11-INX-00001 and includes approximately 20 acres and is owned by the City of Worcester School Department. The Site is situated on the south side of Highland Street, approximately 500' east of Newton Square and 400' west of the intersection of Highland Street and Park Avenue (MA state Routes 9/12/122A). The Site is bounded to the east, south, and west by the so-called "Newton Hill" portion of Elm Park. The Site is generally rectilinear, with an average width of approximately 635' (north / south), and an average length of 1,340' (east / west). The parcel frontage on highland Street is 1,342'+/-.

Zoning Conditions

The Site is located within the RS-7 Residential zoning district; single & two-family residential dwelling district with 7,000sf minimum lot size. The existing school use is allowed by right in this district. No portion of the Site appears to be located within other zoning districts, historic districts, or other overlay districts.

Easements and other Property Limitations

There do not appear to be any easements, rights of way, historic registrations, or other encumbrances related to use on the Site, based on City of Worcester Assessor's data. The parcel was formally part of Elm Park and was conveyed to the City of Worcester for school use in 1961, as defined by a Massachusetts Supreme Judicial Court Degree (WCRD Book 4178, Page 415) related to the use of the parcel by the City of Worcester for school use. Based on the documents provided to us by the City of Worcester, the existing site appears to be available for development.

Existing Development

Roughly 14 acres of the Site is developed with the existing Doherty Memorial High School, vehicle parking and access areas, pedestrian walks, and athletic/practice fields. The pavements and bituminous curbs in nearly all areas of the Site are in a deteriorated condition and exhibit signs of failure, including significant cracking, raveling, and extensive patching. The front access drive (see Site Access section below) is in somewhat better condition than the pavements in other areas.

Picture 1: Pavement Deterioration
Upper Parking Lot

Picture 3: Pavement Deterioration
Upper Parking Lot

Picture 2: Pavement Deterioration
East Access Drive

Picture 4: Pavement Deterioration
Service / Loading Area

**Picture 5: Pavement Deterioration
Service Area Access Drive**

**Picture 6: Pavement Deterioration
East Parking Lot**

**Picture 7: Pavement – Good Condition
Front Access Drive / Bus Loop**

**Picture 8: Pavement – Good Condition
Front Access Drive / Bus Loop**

Site Access and Parking

The Site is accessed by three curb cuts on the south side of Highland Street. The eastern-most curb cut provides access to a parking and service area immediately adjacent to the east side of the school building and to an upper parking lot on the southeast portion of the developed site and which borders the athletic/practice fields. The southerly end of the upper parking lot extends beyond the school parcel and into the remaining land of Elm Park. This portion of the parking lot is commonly shared by school users and by park users accessing Newton Hill trails. The second curb cut on the east side of the side of the site is the entrance to the front access drive / bus loop on the north side (main entrances) of the school building. The bus loop intersects with the access drive to the service yard / loading area and exits the site at the western-most curb cut. See the Traffic and Circulation Assessment section of this report for more detailed information.

Pedestrians access the Site via sidewalks on Highland Street, and from unpaved trail connections to Elm Park (via Newton Hill). Sidewalks extend onto the Site from Highland Street at each of the three curb cuts. The Highland Street sidewalk is also connected to the bus loop by two walks with stairways. Internal pedestrian circulation is accommodated by paved walkways and steps. None of the pedestrian access pathways appear to comply with the American Disabilities Act (ADA) or the Massachusetts Architectural Access Board (AAB) requirements or specifications.

Topography

The Site has been developed in a tiered configuration in response to relatively steep topographic conditions. The first tier is elevated approximately 10-15 feet from Highland Street and the second tier is elevated roughly another 15 feet. The south side of the second tier represents the limit of the developed portion of the Site, around EL. 550-555 (30' up from EL. 520-525 at Highland Street. The undeveloped portion of the site to the south exhibits steep topography averaging 25%. The athletic/practice field on the east side of the site is generally coincident with the upper tier.

Tree cover and vegetation

Vegetation on the developed portion of the Site is completely cleared for lawn and turf, except for minor landscaped areas and several mature trees that remain from the pre-developed site. The undeveloped areas of the site are vegetated with mature tree growth (mixed deciduous and coniferous) and moderate to thick undergrowth.

Soils

Based on National Resources Conservation Service (NRCS) data, the soils on the southern (upper) portion of Site consist of Paxton soil and areas to the north are mapped as Hinckley-Urban Land Complex. Paxton soil consists of glacial till and typically exhibits a shallow restrictive layer that can result in a seasonal perched water table and is classified as a Hydrologic Soil Group (HSG) C soil with relatively low permeability. Hinkley soil is more well-drained and is classified as an HSG-A soil and does not exhibit shallow or perched groundwater conditions. It is unclear where the transition between these two soils lies on the Site, as the area between these two mapped soils has been developed for the school. In general, the soils are not likely to represent a significant development constraint in terms of bearing capacity, workability, groundwater management, or erosion. Although disturbance of the currently undeveloped southern slopes of the Site could result in seasonal high groundwater management needs. Nitsch Engineering noted during our site visit several areas between the two tiers for the school building where ledge was apparent at the ground surface.

Picture 9: Exposed Ledge (apparent)

Picture 10: Exposed Ledge (apparent)

Environmental Resources and Hydrology

There do not appear to be any wetland resource areas or other environmentally sensitive areas on or within close proximity to the Site. There are no rare species (NHESP designated) habitats, or vernal pools on or directly adjacent to the Site. The Site is not within nor directly adjacent to any FEMA flood hazard areas.

2.3 Existing Site Utilities

Storm Drainage

The Site includes a conventional closed pipe runoff collection and conveyance system that consists of a series of catch basins and connecting structures and pipes. The on-site system conveys collected runoff generated by the developed areas of the Site, as well as the northerly face of Newton Hill, to the municipal surface drainage system in Highland Street. The municipal surface drain in Highland Street is an 18" pipe at a relatively flat 0.004ft/ft slope toward Newton Square to the west.

Nitsch Engineering is not aware of any reported deficiencies in the stormwater collection and conveyance system. However, it is unlikely that the system meets current municipal standards in terms of municipal or state stormwater quality management standards.

Sanitary Sewerage

Sanitary sewage generated by the existing school building is discharged via two separate connections to a 15" sanitary sewer main in Highland Street. Two series of pipes and structures that extend from the east and west ends of the existing building collect and convey sewage; both series connect to the Highland Street system with 8" diameter As is the adjacent surface drain, the sanitary sewer main is relatively flat with an average slope in the vicinity of the school of 0.003ft/ft, directly flow toward Newton Square to the west. Nitsch Engineering has not received record documents of the on-site sanitary sewer structures or pipe routing, but no deficiencies in terms of flow or capacity conditions have been reported. During our site visit we did not observe an exterior grease trap from the school kitchen.

Water

Record documents indicate that domestic water and fire protection services are provided to the Site via a 16" low-service water main in Highland Street. The water main was installed in 1894 and was cleaned and lined in 1986. Services from the main include a connection on the west side of the Site that provides water to three site hydrants, and a connection on the east side that provides water to three site hydrants and includes an on-site branch that connects to the school building. The east and west water services are not interconnected (not looped). The building domestic water service/meter is located on the south side / east end of the lower school building tier.

Natural Gas

A natural gas meter was observed in the same vicinity as the water service connection noted above, on the south side / east end of the lower school building tier. The gas service connection at Highland Street is near the eastern curb cut for the bus loop driveway. See narratives by the project Mechanical/Electric/Plumbing consultants for information on existing gas service conditions.

Electrical

Electrical service is provided to the Site via underground conduit. Service extends onto the site at a pad-mounted high voltage switch located to the east of the eastern-most site curb cut. Electric service extends from the switch to a pad-mounted transformer located at the east side of the lower school building tier, adjacent to the east parking lot. See narratives by the project Mechanical/Electric/Plumbing consultants for information on existing electric service conditions.

Telecom

See narratives by the project Mechanical/Electric/Plumbing consultants for information on existing tele-communications service conditions.

2.4 Traffic and Circulation

(See also Nitsch Engineering's Traffic Assessment Memorandum under Section 3.3.3.D.1.b.) Nitsch Engineering conducted a site visit on May 22, 2019 to observe the existing traffic circulation and queue lengths on adjacent streets during drop-off and pick-up periods, as well as the parking utilization at the existing Doherty Memorial High School. Because this assessment focuses strictly on the issues above, traffic operations are secondary to the goals of the report and therefore we did not collect Automatic Traffic Recorder (ATR) counts or Turning Movement Counts (TMC) and an evaluation of roadway and intersection capacity analyses and traffic signal warrants was not performed. Nitsch Engineering observed the site circulation associated with the weekday morning drop-off, weekday afternoon pick-up, and general queue lengths around the school site. The observation occurred during sunny conditions with a temperature of 70 degrees.

Doherty Memorial High School Site Access and Egress

The school is accessed using three curb cuts on Highland Street. The eastern most curb cut provides access to the two main parking lots at the school. The other two curb cuts provide access to the main office, the visitor parking and a third parking lot. They also are used mainly for the bus drop-off and pick-up.

Doherty Memorial High School Traffic Circulation and Pick-up/Drop-off

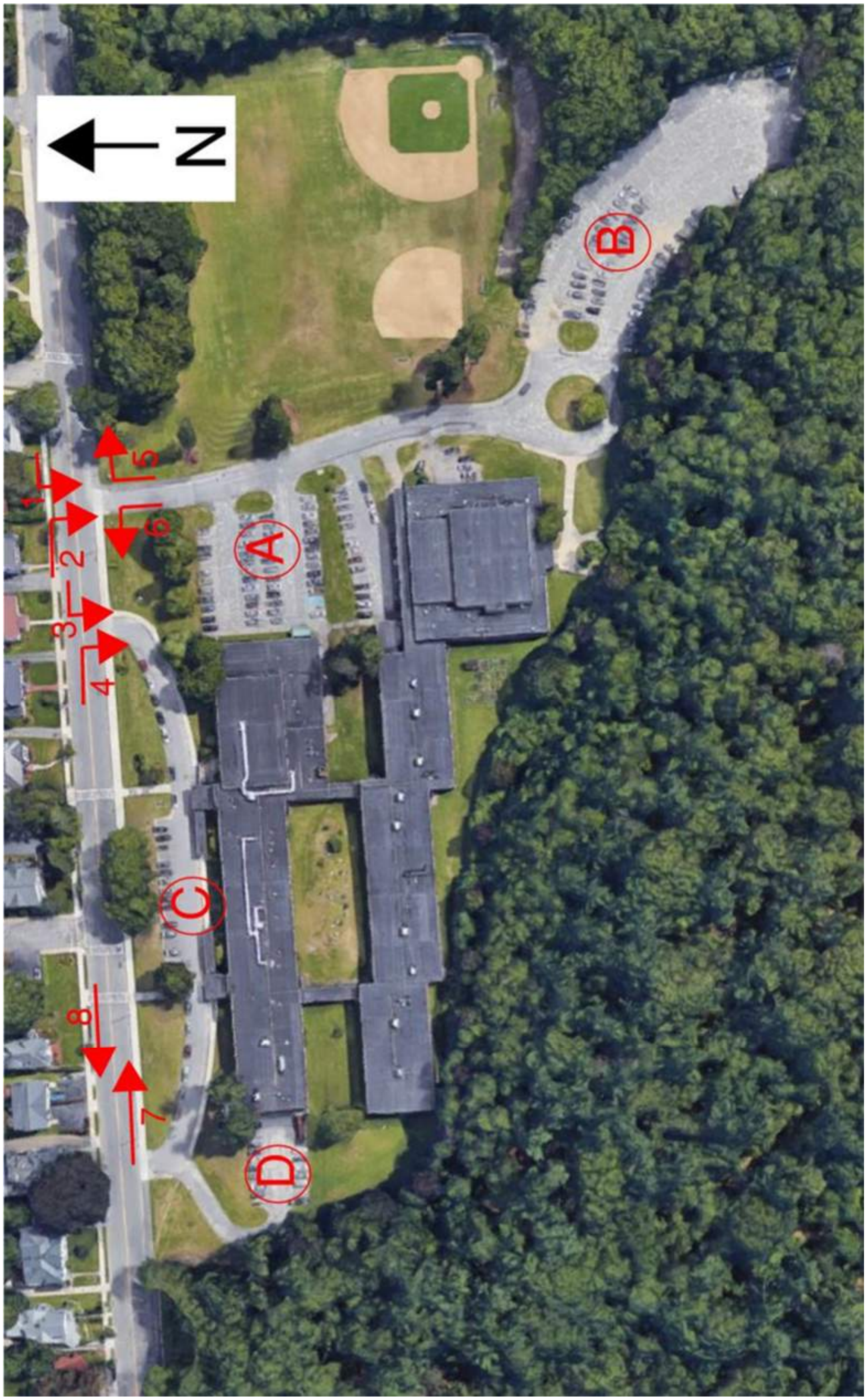
Please refer to the map that follows the Tables for actual count locations.

Table 1 – Doherty School Drop-Off Quantity

Time / Movement	1	2	3	4	5	6	7 (Drop-off)	8 (Drop-off)
6:45 AM 7:00 AM	35	13	16 (2 Buses)	18 (5 Buses)	5	0	18	45
7:00 AM 7:15 AM	85	28	43 (6 Buses)	13 (1 Bus)	26	0	0	8
7:15 AM 7:30 AM	43	17	23 (0 Bus)	12 (0 Bus)	16	0	14	8
7:30 AM 7:45 AM	5	1	7 (0 Bus)	4 (0 Bus)	2	0	0	2
TOTAL	**168**	**59**	**87 (8 Buses)**	**41 (6 Buses)**	**49**	**0**	**32**	**63**

Table 2 – Doherty School Pick-Up Quantity

Time / Movement	1	2	3	4	5	6	7 (Pickup)	8 (Pickup)
1:15 PM 1:30 PM	2	2	7 (6 Buses)	2 (0 Bus)	3	3	19	8
1:30 PM 1:45 PM	5	3	6 (2 Buses)	1 (0 Bus)	4	0	27	21
1:45 PM 2:00 PM	0	0	1 (0 Bus)	2 (0 Bus)	40	1	40	35
2:00 PM 2:15 PM	1	3	0 (0 Bus)	2 (0 Bus)	40	19	6	3
TOTAL	**7**	**8**	**14 (8 Buses)**	**7 (0 Buses)**	**87**	**23**	**92**	**67**



Traffic Circulation Count Location Map

Existing Morning Drop-off Circulation:

The Doherty Memorial High School traffic arrives at Highland Street from 6:45 AM through 7:45 AM. The parents arrive at Highland Street from east and west to drop-off their students along the curb on both sides of Highland Street. Buses arrive at the main entrance driveway through Highland Street to drop-off students from 6:45 AM through 7:15 AM. A total of fourteen buses drop off students at the school.

Existing Afternoon Pick-up Circulation:

The Doherty Memorial High School traffic arrives at Highland Street from 1:15 PM through 2:15 PM. The parents arrive at Highland Street from east and west and park along the curb on both sides of Highland Street and wait to pick-up their students. We observed queue lengths of approximately 900 feet on both sides of Highland Street during the afternoon pick-up time. Buses arrive at the main entrance driveway through Highland Street to pick-up students from 1:00 PM through 1:45 PM. A total of fourteen buses pick-up students at the school.

Doherty Memorial High School Parking Supply and Demand

Nitsch Engineering performed a parking supply and demand count on May 22, 2019. The utilization of the lots was taken at 9:30 AM.

Lot A (Faculty/Student)

- Total Spaces:84
- Occupied: 79
- Accessible: 1(empty)
- Note: 12 cars were parked illegally.
- Utilization: 107%

Lot B (Student)

- Total Spaces:131
- Occupied: 120
- Accessible: None
- Note: 5 cars were parked illegally, and 5 others were parked behind the building.
- Utilization: 99%

Lot C (Faculty/Staff)

- Total Spaces:16
- Occupied: 12
- Accessible: None
- Utilization: 75%

Lot D (Faculty/Staff)

- Total Spaces:18
- Occupied: 18
- Accessible: None
- Note: No pavement markings
- Utilization: 100%

2.5 Development Constraints

Certain physical characteristics of the Site represent development constraints and/or significant redevelopment cost factors including the following:

Pavements

Nearly all the bituminous pavement on the Site is in a poor/failing condition. Under any redevelopment scenario, all paved areas and curbs affected by the project are likely to require complete replacement, except for portions of the front access drive / bus loop.

Topography

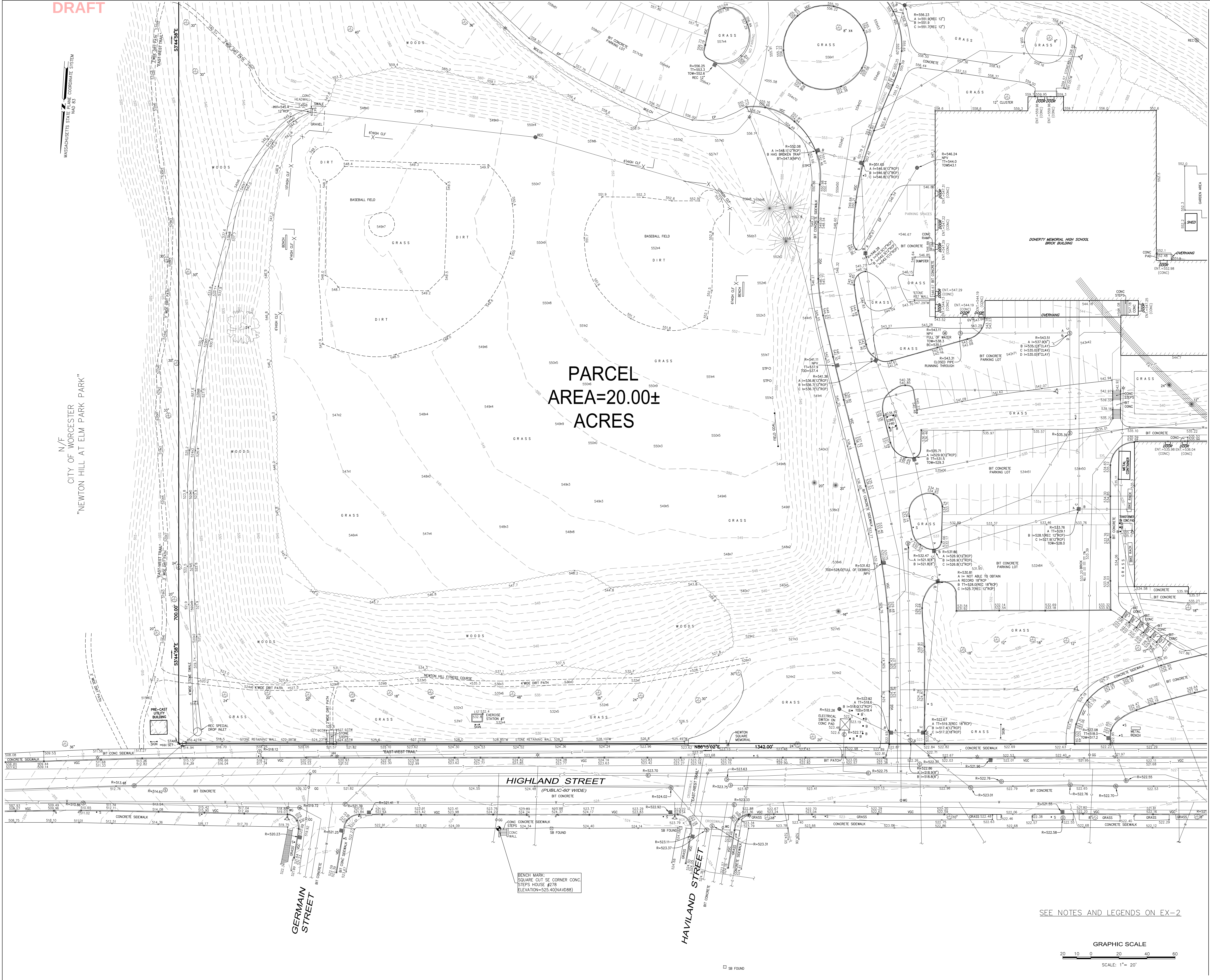
Any redevelopment or reuse scenario for the Site would need to consider the implications of the existing topography. Expansion of the currently developed portion of the Site will require extensive earth moving, probable retaining wall construction, and possible ledge removal.

Stormwater Management System

Because the Site is subject to the City of Worcester Wetland Protection Bylaw, any substantial site construction would require compliance with the Massachusetts Department of Environmental Protection Stormwater Management Standards (per the requirements of the municipal bylaw regulations). As such, it is likely that upgrade and/or replacement of the most, if not all, of the existing drainage infrastructure will be required under most potential redevelopment scenarios.

Sanitary Sewer Service

Although no deficiencies have been reported, the service connection pipes appear to consist of vitrified clay pipes and should be video-inspected under any redevelopment scenario. Further, installation of an exterior grease trap will be required for new construction of the Site, and may be required for a renovation project, depending on the extent of the renovation. Should this system element be necessary for a renovation project, modification of the interior building plumbing system could be required to facilitate separation of kitchen sanitary waste piping.



BENCH MARK:
SQUARE CUT SE CORNER CONC.
STEPS HOUSE #278
ELEVATION=525.40(NAVD88)

SEE NOTES AND LEGENDS ON EX-2

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OWNER

Worcester Public Schools
20 Irving Street,
Worcester MA 01600

PROJECT

Project Status

Doherty Memorial
High School

299 Highland Street, Worcester MA 01602

DRAWING TITLE

COMPILED
EXISTING
CONDITIONS
PLAN

Locus Map

True North

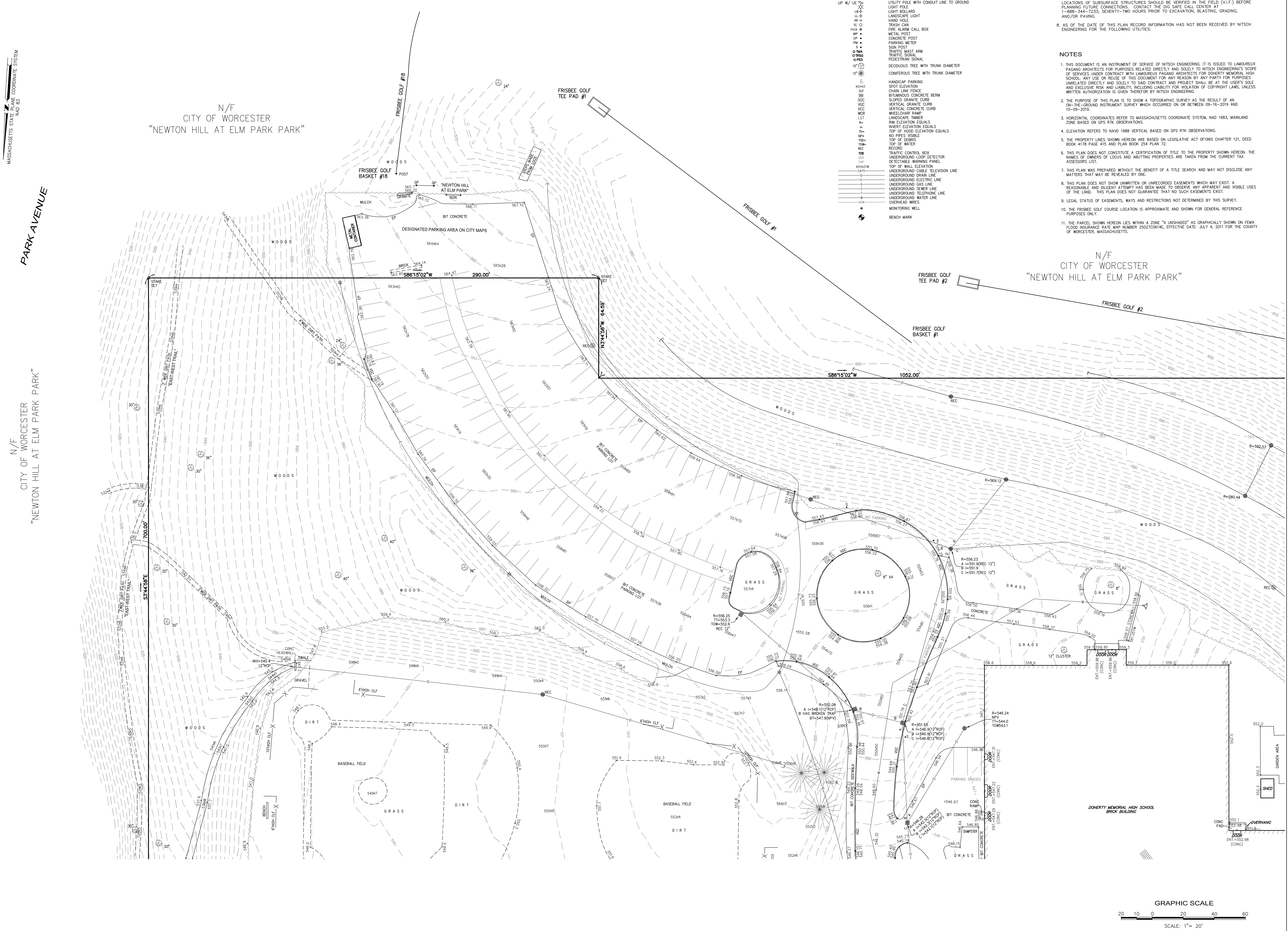
Key Plan

REVISIONS

No.	Description	Date

FILE:	
JOB NO:	PRO. #13325
SCALE:	1"=20'
DWN. BY:	IOS
CKD. BY:	MEV
DATE:	12/13/2019

EX-1



LEGEND

▦	CATCH BASIN
Ⓒ	CABLE TELEVISION MANHOLE
Ⓓ	DRAIN MANHOLE
Ⓔ	ELECTRIC MANHOLE
Ⓜ	MISCELLANEOUS MANHOLE
Ⓢ	SEWER MANHOLE
Ⓣ	TELEPHONE MANHOLE
Ⓦ	WATER MANHOLE
GSO ○	GAS SHUT–OFF
WSO ○	WATER SHUT–OFF
GG ○	GAS GATE
WG ○	WATER GATE
ICV ○	IRRIGATION CONTROL VALVE
CLEANOUT ○	CLEANOUT
BWW □	BOSTON WATER WORKS
	FIRE HYDRANT
DS ○	DOWN SPOUT
UP	UTILITY POLE
UP W/ UE	UTILITY POLE WITH CONDUIT LINE TO GROUND
	LIGHT POLE
LB	LIGHT BOLLARD
LL	LANDSCAPE LIGHT
HH ▭	HAND HOLE
TC ○	TRASH CAN
FACB ▭	FIRE ALARM CALL BOX
MP ●	METAL POST
CP ●	CONCRETE POST
PM ●	PARKING METER
S ●	SIGN POST
○ TMA	TRAFFIC MAST ARM
○ TRSG	TRAFFIC SIGNAL
○ PED	PEDESTRIAN SIGNAL
12"	DECIDUOUS TREE WITH TRUNK DIAMETER
12"	CONIFEROUS TREE WITH TRUNK DIAMETER
♿	HANDICAP PARKING
601×43	SPOT ELEVATION
CLF	CHAIN LINK FENCE
BB	BITUMINOUS CONCRETE BERM
SGC	SLOPED GRANITE CURB
VGC	VERTICAL GRANITE CURB
VCC	VERTICAL CONCRETE CURB
WCR	WHEELCHAIR RAMP
LST	LANDSCAPE TIMBER
R=	RIM ELEVATION EQUALS
I=	INVERT ELEVATION EQUALS
TH=	TOP OF HOOD ELEVATION EQUALS
NPV	NO PIPES VISIBLE
TOD=	TOP OF DEBRIS
TOW=	TOP OF WATER
REC	RECORD
TCB	TRAFFIC CONTROL BOX
ULD	UNDERGROUND LOOP DETECTOR
DWP	DETECTABLE WARNING PANEL
601×43TW	TOP OF WALL ELEVATION
——CATV——	UNDERGROUND CABLE TELEVISION LINE
——D——	UNDERGROUND DRAIN LINE
——E——	UNDERGROUND ELECTRIC LINE
——G——	UNDERGROUND GAS LINE
——S——	UNDERGROUND SEWER LINE
——T——	UNDERGROUND TELEPHONE LINE
——W——	UNDERGROUND WATER LINE
——OHW——	OVERHEAD WIRES
⊕	MONITORING WELL
⊕	BENCH MARK

UTILITY INFORMATION STATEMENT

1. THE SUB–SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE CLIENT, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB–SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB–SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.
2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.
3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.
4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.
5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.
6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.
7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1–888–344–7233, SEVENTY–TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.
8. AS OF THE DATE OF THIS PLAN RECORD INFORMATION HAS NOT BEEN RECEIVED BY NITSCH ENGINEERING FOR THE FOLLOWING UTILITIES:

NOTES

1. THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF NITSCH ENGINEERING. IT IS ISSUED TO LAMOUREUX PAGANO ARCHITECTS FOR PURPOSES RELATED DIRECTLY AND SOLELY TO NITSCH ENGINEERING'S SCOPE OF SERVICES UNDER CONTRACT WITH LAMOUREUX PAGANO ARCHITECTS FOR DOHERTY MEMORIAL HIGH SCHOOL. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT AND PROJECT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN AUTHORIZATION IS GIVEN THEREFOR BY NITSCH ENGINEERING.
2. THE PURPOSE OF THIS PLAN IS TO SHOW A TOPOGRAPHIC SURVEY AS THE RESULT OF AN ON–THE–GROUND INSTRUMENT SURVEY WHICH OCCURRED ON OR BETWEEN 09–16–2019 AND 10–09–2019.
3. HORIZONTAL COORDINATES REFER TO MASSACHUSETTS COORDINATE SYSTEM, NAD 1983, MAINLAND ZONE BASED ON GPS RTK OBSERVATIONS.
4. ELEVATION REFERS TO NAVD 1988 VERTICAL BASED ON GPS RTK OBSERVATIONS.
5. THE PROPERTY LINES SHOWN HEREON ARE BASED ON LEGISLATIVE ACT OF1960 CHAPTER 121, DEED BOOK 4178 PAGE 415 AND PLAN BOOK 254 PLAN 72.
6. THIS PLAN DOES NOT CONSTITUTE A CERTIFICATION OF TITLE TO THE PROPERTY SHOWN HEREON. THE NAMES OF OWNERS OF LOCUS AND ABUTTING PROPERTIES ARE TAKEN FROM THE CURRENT TAX ASSESSORS LIST.
7. THIS PLAN WAS PREPARED WITHOUT THE BENEFIT OF A TITLE SEARCH AND MAY NOT DISCLOSE ANY MATTERS THAT MAY BE REVEALED BY ONE.
8. THIS PLAN DOES NOT SHOW UNWRITTEN OR UNRECORDED EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT AND VISIBLE USES OF THE LAND. THIS PLAN DOES NOT GUARANTEE THAT NO SUCH EASEMENTS EXIST.
9. LEGAL STATUS OF EASEMENTS, WAYS AND RESTRICTIONS NOT DETERMINED BY THIS SURVEY.
10. THE FRISBEE GOLF COURSE LOCATION IS APPROXIMATE AND SHOWN FOR GENERAL REFERENCE PURPOSES ONLY.
11. THE PARCEL SHOWN HEREON LIES WITHIN A ZONE "X UNSHADED" AS GRAPHICALLY SHOWN ON FEMA FLOOD INSURANCE RATE MAP NUMBER 25027C0614E, EFFECTIVE DATE: JULY 4, 2011 FOR THE COUNTY OF WORCESTER, MASSACHUSETTS.

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► Green Infrastructure
► Planning
► GIS

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OWNER

Worcester Public Schools
20 Irving Street,
Worcester MA 01600

PROJECT

Project Status

Doherty Memorial
High School

299 Highland Street, Worcester MA 01602

DRAWING TITLE

COMPILED
EXISTING
CONDITIONS
PLAN

Locus Map

True North

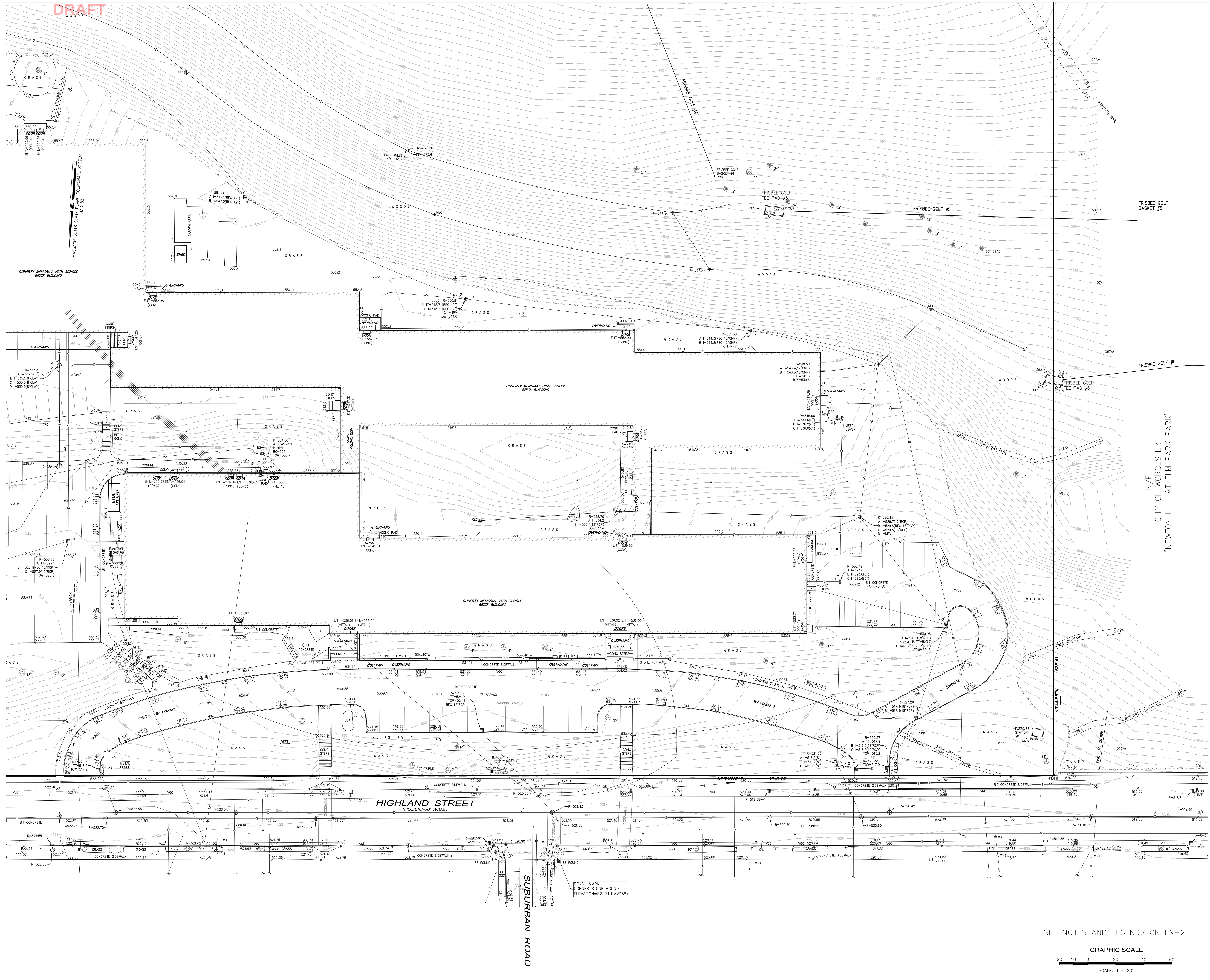
Key Plan

REVISIONS

No.	Description	Date

FILE:
JOB NO: PRO. #13325
SCALE: 1"=20'
DWN. BY: IOS
CKD. BY: MEV
DATE: 12/13/2019

EX–2



SEE NOTES AND LEGENDS ON EX-2

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COMPILED EXISTING CONDITIONS PLAN

Locus Map

True North

Key Plan

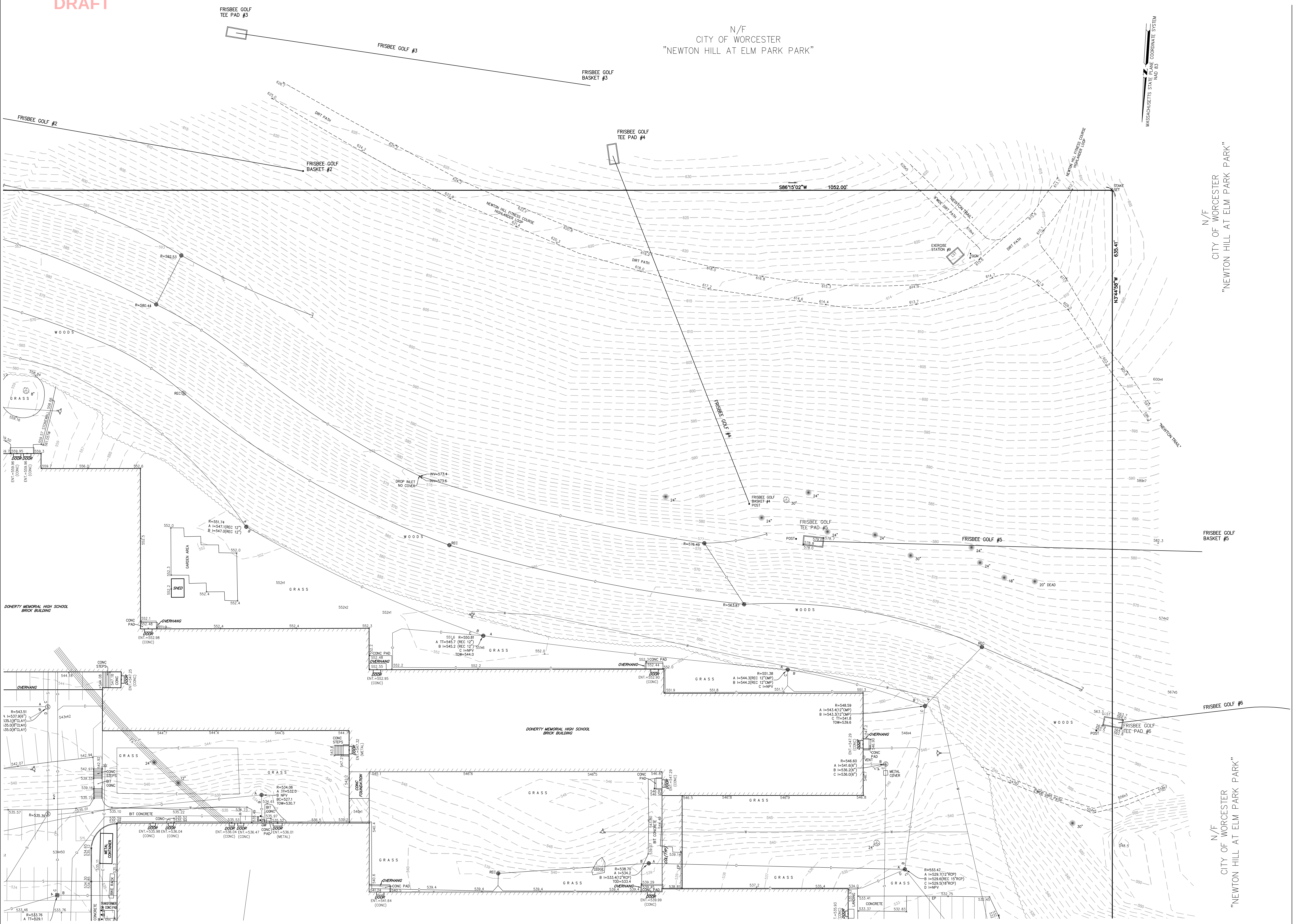
REVISIONS

No.	Description	Date

FILE:
JOB NO: PRO. #13325
SCALE: 1"=20'
DWN. BY: IOS
CKD. BY: MEV
DATE: 12/13/2019

EX-3

DRAFT



SEE NOTES AND LEGENDS ON EX-2

GRAPHIC SCALE

20 10 0 20 40 60

SCALE: 1"= 20'

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DWN. BY:	IOS
CKD. BY:	MEV
DATE:	12/13/2019

EX-4

CITY OF WORCESTER, MASSACHUSETTS
Law Department

David M. Moore
City Solicitor

December 2, 2019

Russell K. Adams
Ass't. Commissioner - Engineering & Architectural Services
Department of Public Works
City of Worcester, Massachusetts

Re: *Newton Hill Questions*

Dear Mr. Adams,

On August 23, 2019 I provided you with a title opinion confirming the city's ownership of the property known as Newton Hill, and more precisely on the twenty acres where the existing Doherty High School facilities now stand and where a new building could be constructed.

This memo addresses questions raised during the public comment period about the title history of Newton Hill.

First and foremost, nothing changes the fact that the city of Worcester holds title to this property. The city acquired this property by virtue of a deed of John W. Wetherill to the city of Worcester dated June 1, 1888 and recorded in the Worcester District Registry of Deeds in Book 1266 at Page 644. This deed was one of three deeds and two orders of taking recorded simultaneously in June of 1888. This primary original acquisition parcel conveyed 45.77 acres of land to the city for the "purpose of a "Public Park." It was from this 47 acre parcel that, 73 years later, a twenty-acre parcel was delineated and transferred to the School Department for "school purposes." This transfer was authorized and accomplished in 1961 under a decree of the Supreme Judicial Court and allowed for the construction of the current Doherty High School on the "Doherty Parcel."

After public review of the August 23rd title opinion we received several questions concerning this conclusion. The remainder of this memo addresses those issues and questions.

The first issue questions the original 1888 deeds on the basis that the city lacked authority to acquire Newton Hill.

Twice before the actual conveyances in 1888, the city sought and received special legislation authorizing the acquisition of Newton Hill: chapter 263 of the Acts of 1884 and, before that, chapter196 of the acts of 1873. By their terms, the 1884 act expired after one year and the eariler1873 act expired after two years.

There can be no question that, by June 1, 1888, the authority granted by these acts had expired. The question is whether there is a third special act authorizing this acquisition or whether there was some other legal authority or process that allowed the city to proceed with this acquisition.

It is virtually impossible to imagine that the city acted without legal authority in the acquisition of this land. Newton Hill was and is a prominent landmark in the city. It was actually referred to as the "new city common." This, plus the two prior special acts, indicates that the inhabitants of Worcester were generally aware, and that city officials in particular were aware, that the city needed special authority to make this acquisition. The reasons that these deadlines appear to have expired are a matter for city historians as clearly there is more to the story of the acquisition of these parcels than what we can learn from recorded documents. There are a number of theories that fill this gap.

> First, it is likely that the legislature amended the 1884 act to expand the time in which the city had authority to acquire the Newton Hill parcels. This type of amendment would have been in the form of a paragraph in an unrelated special act or an act included in the state budget or some other larger pieces of general legislation. The Acts and Resolves books from that era are not searchable; making the review of every act of the legislature for a four-year period a daunting, if not impossible, task. It is for situations like this where the courts would apply the doctrine whereby the law presumes that public officials act with legal authority in conducting public business.
>
> Second, the legal principle of adverse possession grants ownership of land to anyone, including government entities, who occupies it and treats it as his own for twenty uninterrupted years. Adverse possession may be accomplished "in pais" in that formal proceedings are not required to accomplish a taking. See, G.L. c.79 §10. If the city officials who managed the acquisition of this land in 1888 were somehow derelict in their duties so as to act with expired legal authority, the city would have acquired title as early as 1908 by adverse possession. (As of 2020, the city will have owned this land for over 130 uninterrupted years).
>
> Third, the General Court has recognized the city's ownership of Newton Hill in at least three special acts adopted over a time span of 98 years: chapter 121 of the acts of 1960, authorized the city to use up to 20 acres of the Newton Hill parkland for school purposes; chapter 203 of the Acts of 2012 stated that, whenever the land was not needed for school purposes it would be returned to park use; and, finally, chapter 574 of the acts of 1914, in authorizing the construction of a fire alarm building in the park, tacitly recognized that the city owned the land. None of these acts would have occurred unless the city owned the land in question.
>
> Lastly, the recorded documents show that the state Supreme Judicial Court decreed in 1961 that the city could use 20 acres of parkland as the site of the then-new Doherty High School. This decree surely would not have been issued if the city was unable to demonstrate that it owned the land. It is a virtual certainty that, given the level of scrutiny one would expect from the legislature and the Supreme Judicial Court, that a key fact, ownership of the land, was put to the test and proved in favor of the city.

The second question focuses on the validity of the original change in use from park purposes to school purposes.

City property is acquired and held by the city for some particular public purpose, i.e., water, sewer, school, highway, fire department, economic development, the seat of the city government (City Hall), etc. See *Harris v. Town of Wayland*, 392 Mass. 237, 240 (1984) and G.L. c. 40, §§ 3, 14, 15, and 15A. That public purpose can be changed if the officer or board presently controlling the land determines that it is "no longer necessary" for the existing use and if the city council votes to transfer the property to another public purpose or to dispose of the land, returning it to private use and ownership. G.L. c. 40 §15A.

Since 1972, park land and conservation land has been protected by an amendment to the state constitution ("Article 97"). This article applies whenever there is a proposal to sell or change the use of city land held for conservation or environmental purposes. In such a case, Article 97 requires a two-thirds vote of the state legislature. This vote is in addition to the local actions described above (declaration of surplus and city council vote to sell or change use of city land).

Clearly the use of this land was changed from park purposes to school purposes. This question was apparently at the heart of the 1961 decision of the Supreme Judicial Court. The fact that the city filed an action against the attorney general suggests that this was most likely a "cy pres" action seeking court approval of a change in the authorized use of public property. The language of the decree indicates that approval of a change in use of the land was the central issue in the case. The court stated:

> "it is ordered, adjudged and decreed that the city of Worcester be and is hereby authorized to use twenty acres of the park land known as Newton Hill ... as delineated on an attached plan entitled "Land Acquired by the City of Worcester for School Purposes ...".

The ruling in the 1961 case was issued by the state's highest court. It is binding, valid and immutable today because any appeal period has long since expired. Its conclusion cannot be re-litigated now because the legal doctrine of *res judicata* prevents settled matters from being re-litigated. See *Degiacomo v. City of Quincy*, 476 Mass. 38 (2016)(a decree in prior equity proceeding that city was authorized to execute proposed lease was res judicata to successor trustee's action); *Heck v. Humphrey*, 512 U.S. 477, 114 S. Ct. 2364, 2367 (1994).

Therefore, it is indisputable that 1) the city owns Newton Hill; and, 2) a 20-acre portion of Newton Hill is held by School Committee for school purposes.[1] This question, having been litigated fully, cannot be re-litigated now to reach a different result.

There is one more legal obstacle to anyone seeking a court determination that the city is prohibited from using this property as the location of Doherty High School. The law places limits on the time periods by which lawsuits must be filed and served. Whether it be three years,

---

[1] It has also been raised that the 1961 SJC Decree only authorized the city to use the land for school purposes and not specifically to construct a school building on it. This argument fails because the construction and operation of school buildings is clearly a sub-component of "school purposes" in general. See, Worcester City Charter, §4-1(d)(5): The school committee is vested with the power to "take control of all school buildings and grounds connected therewith."

or six years or twenty years (the longest possible), the statute of limitations would prohibit any new legal actions.

Conclusion. The fact is that the city is not now changing the use of this parcel. There is no need for a declaration of surplus, no votes of the city council are required and no vote of the state legislature is required. The city is acting consistently with the change of use decreed by the Supreme Judicial Court in 1961. By using this parcel to construct a new Doherty High School the city would not be doing anything that it isn't already doing and, in fact, has been doing for almost 60 years.

Sincerely,

David M Moore

David M. Moore
City Solicitor

cc: Edward M. Augustus, Jr., City Manager
Joseph M. Petty, Mayor

ATTACHMENT A

Atlas Sketch showing the
Five Original Newton Hill Acquisition Parcels

- Deed of John W. Wetherill conveying 15,000 s.f. of land to the city of Worcester dated June 1, 1888 and recorded in the Worcester District Registry of Deeds in Book 1266 at Page 642;
- Deed of John W. Wetherill conveying 45.77 acres of land to the city of Worcester dated June 1, 1888 and recorded in the Worcester District Registry of Deeds in Book 1266 at Page 644;
- Deed of William S. Lincoln 5.2 acres of land to the city of Worcester dated June 4, 1888 and recorded in the Worcester District Registry of Deeds in Book 1266 at Page 648;
- Order of Taking of 2.7 acres of land from Nathan S. Johnson adopted on May 28,1888 by the Board of Park Commissioners of the city of Worcester and recorded in the Worcester District Registry of Deeds in Book 1266 at Page 647;
- Order of Taking of 0.8 acres of land from Chauncey adopted on June 4, 1888 by the Board of Park Commissioners of the city of Worcester and recorded in the Worcester District Registry of Deeds in Book 1266 at Page 648.

NOTES

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2. THE PURPOSE OF THIS PLAN IS TO SHOW SITE FEATURES TO BE USED FOR PRELIMINARY PURPOSES ONLY. THIS PLAN REPRESENTS A COMPILATION OF DATA INCLUDING GIS DATA OBTAINED FROM MASSGIS (ABUTTERS AND BUILDINGS) AND THE TOPOGRAPHIC PLAN PREPARED BY R.E. CAMERON & ASSOCIATES NAMED "TOPOGRAPHIC PLAN FOLEY STADIUM CHANDLER STREET, WORCESTER, MASS. DATED 2/15/2006" (PLANIMETRIC FEATURES AND CONTOUR DATA), ALONG WITH A LIMITED FIELD TOPOGRAPHIC AND LOCATION SURVEY OF OF THE SITE TO INCLUDE LOCATIONS OF ON SITE BUILDINGS, BUILDING ENTRANCES, EDGE OF PAVING, OBSERVABLE UTILITIES, AND SPOT CHECKS OF LIDAR DATA. BELOW GRADE UTILITY INFORMATION WAS PROVIDED BY VARIOUS SOURCES.
3. LIMITED ON THE GROUND TOPOGRAPHIC SURVEY WAS PERFORMED FROM 10-02-19 TO 10-16-19.
4. PROPERTY LINES SHOWN ARE BASED ON PRELIMINARY RESEARCH OF PUBLIC RECORDS FROM THE WORCESTER REGISTRY OF DEEDS AND PRELIMINARY FIELD LOCATIONS OF MONUMENTATION AND OCCUPATION LINES AND DOES NOT REPRESENT A FINAL DETERMINATION OF PROPERTY LINE LOCATIONS.
5. HORIZONTAL COORDINATES REFER TO MASS STATE PLANE NAD83 (2011) EPOCH 2010.0, US SURVEY FOOT, UTILIZING GPS RTK METHODS.
6. ELEVATION REFERS TO NAVD88, GEOID 12A, UTILIZING GPS RTK METHODS.

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- Planning
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CONSULTANT'S STAMP

OWNER

Worcester Public Schools
20 Irving Street,
Worcester MA 01600

PROJECT

Project Status

Foley Stadium

305 Chandler Street, Worcester MA 01602

DRAWING TITLE

COMPILED EXISTING CONDITIONS PLAN

Locus Map

True North

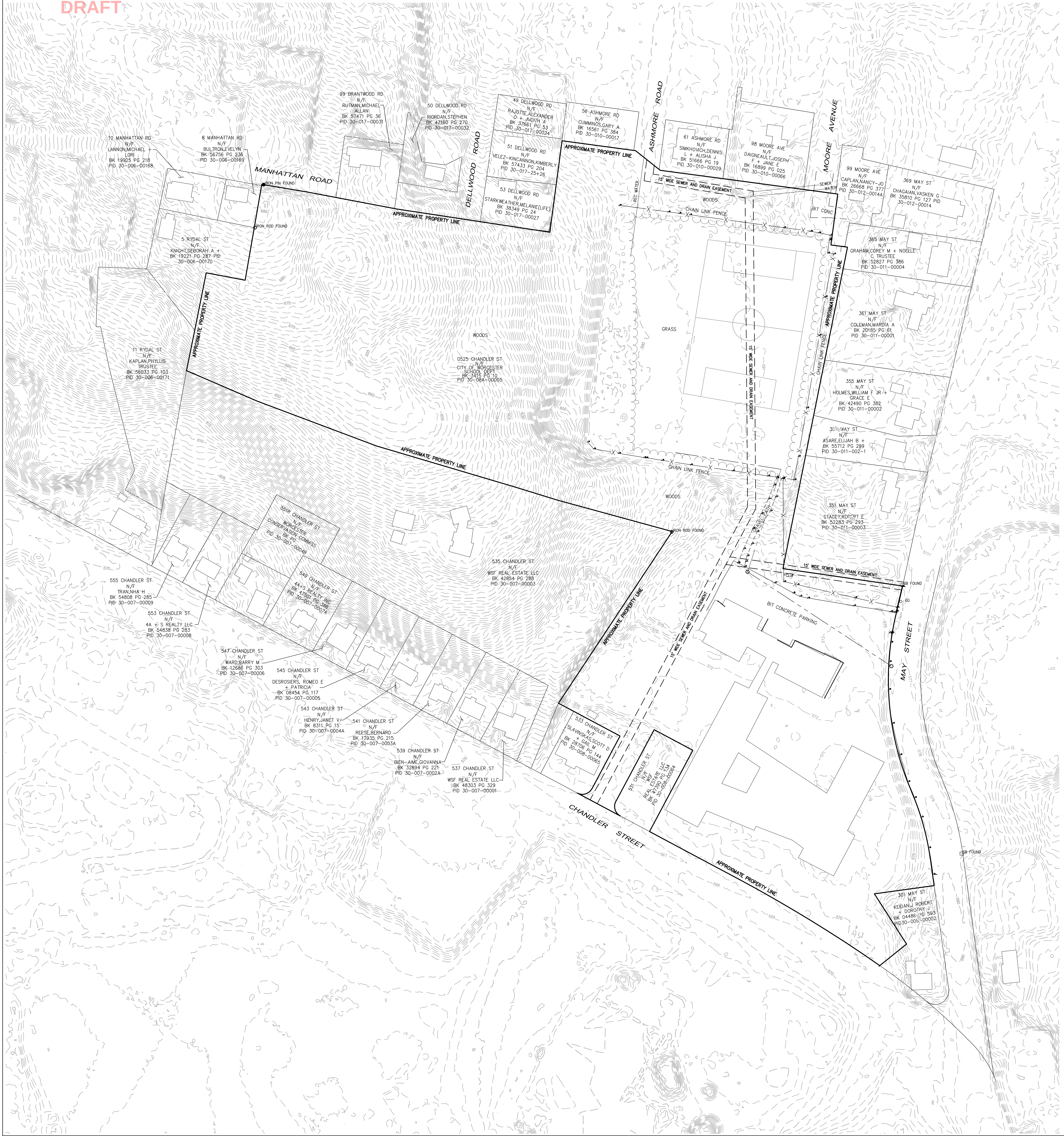
Key Plan

REVISIONS

No.	Description	Date

FILE:	13325_FOLEY_TOPO1.DWG
JOB NO:	PRO. #13325
SCALE:	1"=20'
DWN. BY:	IOS
CKD. BY:	MEV
DATE:	12/13/2019

EX-1



MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NAD 83

NOTES

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2. THE PURPOSE OF THIS PLAN IS TO SHOW SITE FEATURES TO BE USED FOR PRELIMINARY PURPOSES ONLY. THIS PLAN REPRESENTS A COMPILATION OF DATA INCLUDING GIS DATA OBTAINED FROM MASSGIS (ABUTTERS AND BUILDINGS) AND NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) LIDAR DATA (CONTOUR DATA). THIS DATA SET IS FROM THE LiDAR 2015 USGS MAINE & MASSACHUSETTS QL1 & QL2 WITH AN ESTIMATED VERTICAL ACCURACY OF SIX-TENTHS OF A FOOT, ALONG WITH A LIMITED FIELD TOPOGRAPHIC AND LOCATION SURVEY OF OF THE SITE TO INCLUDE LOCATIONS OF ON SITE BUILDINGS, BUILDING ENTRANCES, EDGE OF PAVING, OBSERVABLE UTILITIES, AND SPOT CHECKS OF LIDAR DATA. BELOW GRADE UTILITY INFORMATION WAS PROVIDED BY VARIOUS SOURCES.
3. LIMITED ON THE GROUND TOPOGRAPHIC SURVEY WAS PERFORMED FROM 10-14-19 TO 10-25-19.
4. PROPERTY LINES SHOWN ARE BASED ON PRELIMINARY RESEARCH OF PUBLIC RECORDS FROM THE WORCESTER REGISTRY OF DEEDS AND PRELIMINARY FIELD LOCATIONS OF MONUMENTATION AND OCCUPATION LINES AND DOES NOT REPRESENT A FINAL DETERMINATION OF PROPERTY LINE LOCATIONS.
5. HORIZONTAL COORDINATES REFER TO MASS STATE PLANE NAD83 (2011) EPOCH 2010.0, US SURVEY FOOT, UTILIZING GPS RTK METHODS.
6. ELEVATION REFERS TO NAVD88, GEOID 12A, UTILIZING GPS RTK METHODS.

GRAPHIC SCALE

60 30 0 60 120 180

SCALE: 1"= 60'

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ARCHITECT'S STAMP

PROGRESS PRINT:
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ALL DIMENSIONS ARE SUBJECT
TO FIELD VERIFICATION

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- Civil Engineering
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OWNER

Worcester Public Schools
20 Irving Street,
Worcester MA 01600

PROJECT

Project Status

Chandler Magnet Elementary School

525 Chandler Street, Worcester MA 01602

DRAWING TITLE

COMPILED EXISTING CONDITIONS PLAN

Locus Map

True North

Key Plan

REVISIONS

No.	Description	Date

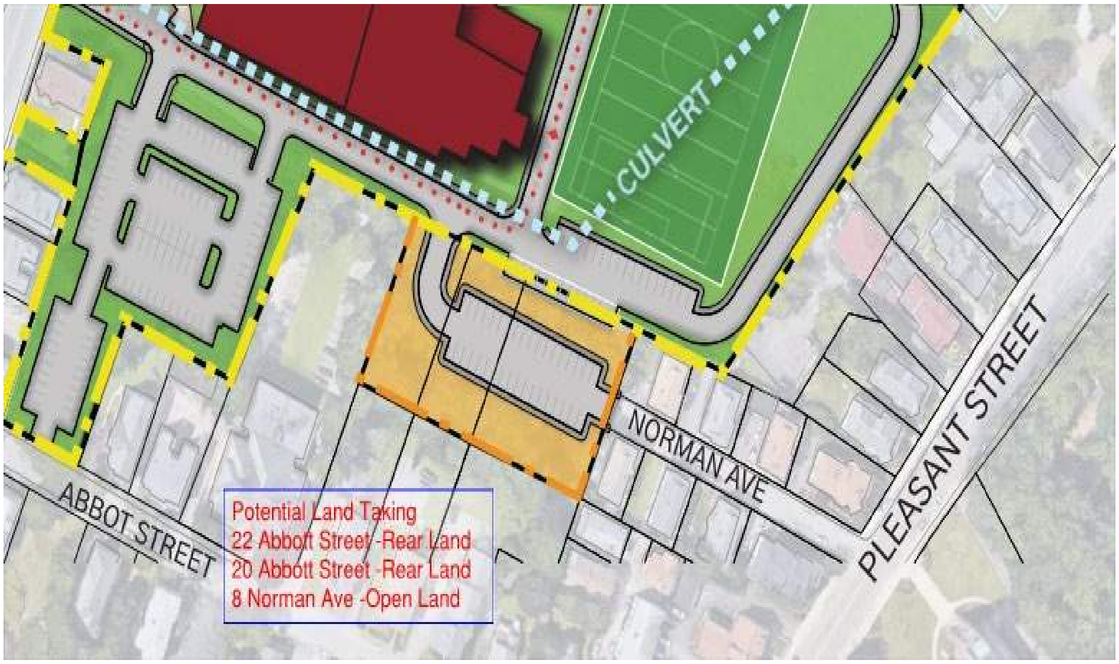
FILE: 13325_MAGNET_TOPO1.DWG
JOB NO: PRO. #13325
SCALE: 1"=20'
DWN. BY: IOS
CKD. BY: MEV
DATE: 12/13/2019

EX-1

FOLEY STADIUM SITE

- The Foley Stadium Site, Land acquisition is potentially required for emergency, service access and pedestrian access to the site from Pleasant Street through Norman Avenue.
- If this site is chosen, review will be required with the City if they find the additional land is advantageous, and then proceed with the acquisition though the eminent domain process.
- If deemed required, this process would occur prior to the end of the Schematic Design to be in place after the funding agreement is finalized.

Foley Stadium Land	Acreage
8 Norman Avenue – open land	0.45
20 Abbott Street – undeveloped rear land	0.23
22 Abbott Street – undeveloped rear land	0.23
sub total	0.91

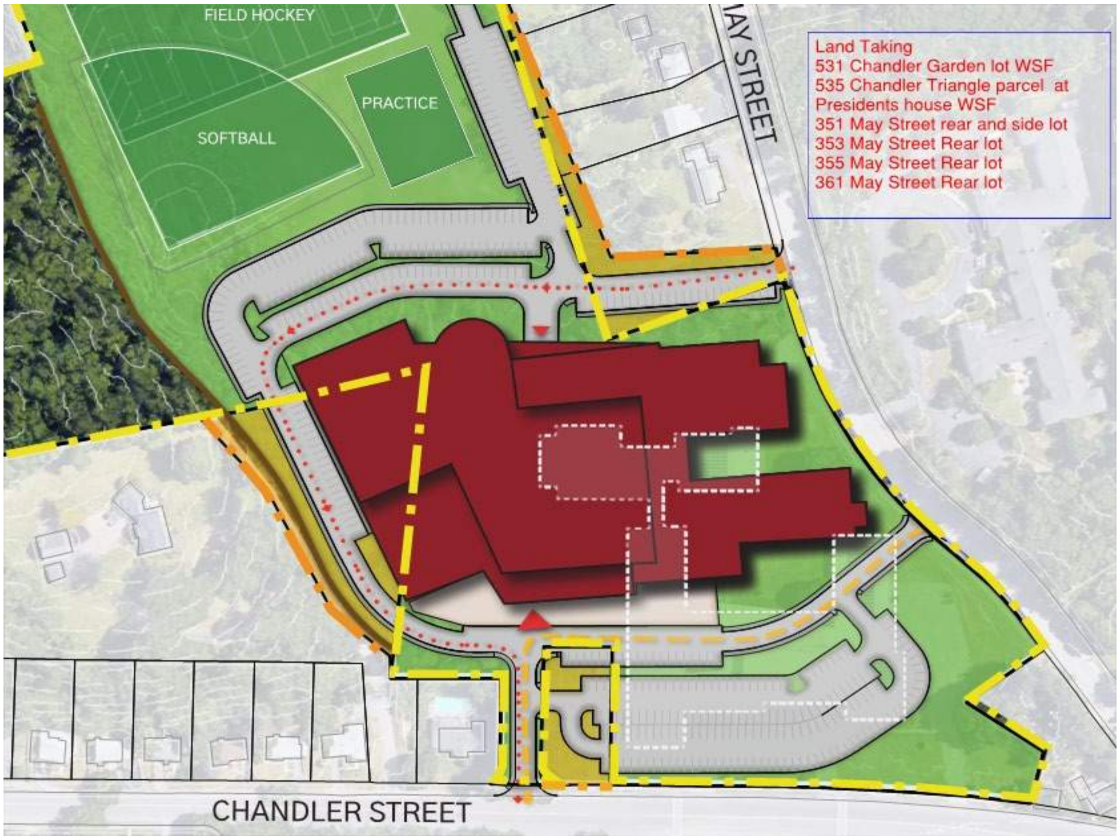


CHANDLER MAGNET SITE

- The Chandler Magnet Site, Land acquisition is required for the development of project,

- If this site is chosen, the City will proceed with the acquisition though the eminent domain process. This process would occur prior to the end of the Schematic Design to be in place after the funding agreement is finalized.

Chandler Magnet Land	Acreage
531 Chandler Garden lot WSF	0.32
535 Chandler Triangle parcel east of Presidents house WSF	1.23
351 May Street rear and side lot	0.44
353 May Street Rear lot	0.04
355 May Street Rear lot	0.04
361 May Street Rear lot	0.03
sub total	2.10



LGCI
Lahlaf Geotechnical Consulting, Inc.

December 12, 2019

Mr. Robert Para Jr., AIA
Lamoureux Pagano & Associates, Inc.
108 Grove Street, Suite 300
Worcester, MA 01605
Tel: (508) 752-2831
Fax: (508) 757-7769
E-mail: RPara@lpaa.com

Re: Preliminary Geotechnical Review Services
Proposed Doherty High School
Doherty Site
Worcester, Massachusetts
LGCI Project No. 1922

Dear Mr. Para:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has performed a site visit and completed a preliminary review of the geotechnical data available for the Doherty High School (Doherty Site) in relation to the proposed Doherty High School in Worcester, Massachusetts. Our services were performed in accordance with our proposal No. 19087 dated October 14, 2019. Ms. Kathryn Crockett of Lamoureux Pagano & Associates, Inc. (LPA) authorized our services by signing our proposal on November 13, 2019.

This letter includes a summary of our field observations, a summary of the subsurface data we reviewed, our opinion about possible foundation issues during construction, and our recommendations for subsurface explorations.

1. Reviewed Documents

LGCI reviewed the following documents:

- “Custom Soil Resource Report for Worcester County, Massachusetts, Northeastern Part,” (Soil Survey Report) National Cooperative Soil Survey/National Resources Conservation Services, USDA (Map and soil description printed November 15, 2019 from https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx).

- “Surficial Materials Map of the North Worcester, Massachusetts,” prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 126 – North Worcester.

- Drawings EX-1 to EX-4, titled: “Existing Conditions, Doherty Memorial High School, 299 Highland St., Worcester, MA 01602, prepared by Nitsch Engineering, Inc. dated October 28, 2019, and provided to us by LPA via e-mail on October 31, 2019.

- Plan titled: "Site Grading & Drainage, Dr. Leo T. Doherty, Memorial High School, Worcester, Mass." (1964 Grading Plan) Prepared by C. W. Buckley Inc., dated January 28, 1964, and provided to us by LPA via e-mail on August 23, 2019.

- Sketch showing concept plan titled: "3.3.3 - Final Evaluation of Alternatives, Preliminary Design Options, Option B.1 - New Construction on Doherty Site (Proposed Scheme), provided to us by LPA via e-mail on December 6, 2019.

- Sketches showing preliminary grading (Preliminary Grading Plans) provided t us by LPA via e-mail December 6, 2019.

2. Site Location Description

We understand that one of the sites being considered for the proposed Doherty High School is the Doherty Site located at 299 Highland Street in Worcester, Massachusetts as shown in Figure 1. The site is located at the foot of Newton Hill, a drumlin. The site is bordered by Newton Hill on the southern side, by residential properties on the eastern (Park Avenue) side, by wooded land on the western side, and by Highland Street in the northern side. The site is occupied by the existing Doherty Memorial High School. The existing school consists of several interconnected buildings terraced on the foot of Newton Hill. The site includes an athletic field on the eastern side, a parking lot on the southern side, and small parking lots and driveways leading to the terraces.

Based on the Site Plan, the ground surface at the site ranges from about El. 520 feet on Highland Street to about El. 567 feet at the rear of the southern parking lot.

Based on the historical topo maps, included in Attachment A, the site appears to have been cut within the area of the existing building and filled in the area of the existing athletic fields.

3. Project Description

We understand that the City of Worcester is considering the existing Doherty High School as one of three possible sites for the proposed Doherty High School. We understand that if the Doherty Site is selected, the proposed construction would consist of a high school building on the eastern side of the site near Parker Avenue, i.e., mostly within the existing athletic field and the southern parking lot.

Based on the Proposed Scheme, the proposed building will consist of two wings configured in a fan-shape and connected on their southern sides. Based on the Preliminary Grading Plans, we estimate that the proposed building will have a footprint of about 160,000 square feet and will be five stories high. Based on the Site Plan, the existing grades range between about El. 530 feet on the northern side and El. 565 feet on the southern side of the proposed building footprint. Based on the Proposed Scheme and the Preliminary Grading Plans, we understand that the proposed floors will be configured as follows:

- The first floor of the proposed building will cover a portion of the proposed building footprint on the northern side and will have a finished floor elevation (FFE) of El. 525 feet. Cuts of 5 to 25 feet will be required to achieve the proposed first floor FFE. The area south of the first floor will not be excavated.
- The second and third floors of the proposed building will extend over the entire footprint of the proposed building and will have FFEs of El. 545 feet and El. 560 feet, respectively. The southern portion of the second floor will be a slab-on grade and will include a garage. Cuts ranging between 2 and 20 feet will be required to achieve the second floor FFE.
- The fourth floor of the proposed building will extend over the eastern portion of the proposed building footprint while its southern portion will be a roof. The fourth floor will have an FFE of El. 575 feet.
- The fifth floor of the proposed building will only extend over the southeastern portion of the proposed building footprint and will have an FFE of El. 590 feet.

After the proposed building is completed, the existing building will be demolished and a proposed athletic field will be provided on the western side of the site; and at-grade parking lot will also be provided between the proposed building and the proposed athletic field.

Based on the Proposed Grading Plan, the proposed exterior grade will range between about El. 550 feet ad El. 560 feet on the southern side of the proposed building. The proposed grades will drop in a northerly direction and will be about El. 535 feet on the northern side. The proposed grade in the proposed at-grade parking lot will range between El. 530 feet and El. 540 feet. We understand that the proposed grade within the proposed athletic field will be around El. 530 feet. To achieve the exterior finished grades, cut of up to 25 feet will be required in the proposed at-grade parking lot and cuts of about 17 feet will be required in the proposed athletic field.

Field Observations

An LGCI representative visited the site on December 5, 2019. The purpose of our visit was to observe site features such as wet areas and other features that may impact construction. Photographs taken during our site visit are included in Attachment B.

The site was mostly covered with about one foot of snow at the time of our visit and site features were concealed by the snow.

The exposed surface visible at the time of our visit such as the parking lot on the western side of the grandstands and the concrete walkway just north of the grandstands showed no evidence of gross settlement. Cracks in the concrete slabs near the entrance were observed. We also did not observe evidence of settlement between the ground surface adjacent to the grandstands and the grandstands' foundation. It is not known whether the ground around the pile-supported grandstands was regraded over time as a result of settlement of ground. Photographs of the site are included in Attachment B.

Summary of Existing Subsurface Data

Soil Survey Report – Based on the Soil Survey Report listed in Section 1, the soils at the site are classified primarily as Urban Land, Smoothed Udorthents, and Paxton Fine Sandy Loam. Urban Land is defined as excavated and filled land. Udorthents are defined as “made land over firm loamy basal till.” Paxton Fine Sandy Loam are defined as ground moraines, drumlins, and hills. The Soil Survey Report does not include the thickness of the A and B horizons for the Urban Land and the Udorthents. However, it includes for the Paxton Fine Sandy Loam a thickness of Horizon A of up to 8 inches, and a thickness of Horizon B of up to 18 inches. Based on the Soil Survey Report the depth to ground water is deeper than 80 inches in the Urban Land and the Udorthents, and ranges between 18 and 37 inches beneath the ground surface in the Paxton Fine Sandy Loam.

A copy of the Soil Survey Report and Map are included in Attachment C.

Surficial Geologic Map – The Surficial Geologic Map (listed in Section 1) indicates that the soils in the general vicinity of the site generally consist artificial fill, thin till, and thick till. The artificial fill is located on the eastern side of the site within the existing athletic fields. The thin till is described as non-sorted, non-stratified matrix of sand, some silt, and little clay than contains scattered pebbles, cobbles and boulders. The thin till is generally less than 10 to 15 feet thick. The thin till is generally located near the northern side of the site. The thick till is similar in composition to the thin till but is more than 10- to 15-feet thick.

The Surficial Geologic Map of the site is shown in Figure 2.

Previous Explorations – Based on the 1964 Grading Plan, ten (10) borings were advanced at the site in 1959 and seven (7) borings were advanced at the site in 1963. The logs of nine (9) of the 1959 borings (#1, #2, #3, #5 to #10) and seven (7) of the 1963 borings (#11 to #17) are shown on the 1964 Grading Plan. The logs were generally copied from faded plans and are not very legible. Also, the borings logs did not include the thickness of individual layers.

The locations of borings #1 to #6 are not shown in the 1964 Grading Plan. The locations of borings #7 to #17 are shown on the 1964 Grading Plan and were generally advanced within and around the existing building footprint. Borings #1, #2, #3, #5 to #13, and #15 extended to depths ranging between 8 and 16 feet beneath the ground surface. The depths of borings #14, #16, and #17 could not be determined.

The locations of the 1959 and 1963 borings and the enlarged boring logs are included in Attachment D.

The borings generally indicated topsoil overlaying loose sand, overlaying dense sand. The topsoil was generally described as loam and loamy sand. The sand underlying the topsoil was generally described as a loose fine yellow sand with trace amounts of stone and gravel. Natural medium dense to very dense sand was encountered beneath the loose sand and extended to the termination depth of most borings, except for boring #11 and #13 which were terminated in clay and glacial till, respectively.

Refusal was encountered in borings #6, #9, #11, and #12 at depths of 12.5, 12, 11, 14.1 feet beneath the ground surface, respectively. Refusal was also encountered in boring #16 at a depth that appears to be 9 feet.

The legible (SPT) N-values ranged between 20 and 200 bpf, with most values greater than 40 bpf, indicating dense to very dense material. The high SPT N-values may be caused by obstructions in the soil. The 1964 Grading Plan indicates the football field west of the existing building contains a boulder deposit area.

4. Preliminary Recommendations

Please note that the review of available information summarized in this letter is not a substitute for a subsurface exploration program. The information gathered as part of this review may be incomplete and the recommendations derived therefrom are at best preliminary in nature and must be confirmed with actual subsurface explorations, laboratory testing, and geotechnical analyses.

Based on our review of the documents listed in Section 1, our understanding of the proposed construction, and our review of the previous explorations at the site, there are a few issues that we would like to highlight for consideration and discussion.

- The 1959 and the 1963 borings indicated loam and loose sand overlying natural sand. It is not known whether the loam and the loose sand were removed before the fill was placed to make the existing athletic fields. There are no records documenting whether the existing fill was placed with strict moisture, density, and gradation control . Such fill presents the risk of unpredictable settlements that may result in the poor performance of floor slabs and foundations. While the proposed grades may require removing most of the existing fill, the proposed excavations to reach the proposed FFE may not locally extend deeper than the bottom of the existing fill and the possible underlying loam and loose sand. These materials are not suitable to support the proposed building and should be entirely removed and replaced with Structural Fill.

- The natural glacial till is suitable to support the proposed building with footings and slabs placed on Structural Fill placed directly in top of the glacial till.

- Near the northern side of the site, the cuts may extend into bedrock where the glacial till is thin. Provisions should be made to include a contingency for rock blasting.

- We believe that the fill formerly placed to raise the grades within the existing athletic fields was glacial till cut from the southern side of the site. The glacial till is generally silty and the existing fill is anticipated not to meet the gradation requirements for Ordinary Fill or Structural Fill. The existing fill could be improved by processing it through a crusher with boulder and blasted rock from the site, if any, or imported blasted rock.

5. Recommendations for Subsurface Explorations

To explore for the presence of buried loam (organic soil) beneath the existing fill within the existing athletic fields and to explore for rock in deep cut areas, we recommend performing additional explorations at the site if this site is selected. The additional explorations should include at least sixteen (16) to twenty (20) soil borings, including at least six (6) borings to rock, and two (2) groundwater observation wells. The geotechnical explorations should also include at least twelve (12) test pits to explore for rock in shallow till areas.

The geotechnical explorations should be coordinated with the work of an environmental engineer to pre-characterize the site soils that will be generated during the deep cuts and that will need to be disposed of offsite.

Limitations

Our letter is based on project information provided to us at the time of this letter. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this letter shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based solely on these preliminary recommendations.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminates in or around the site.

The recommendations in this letter are based in part on the data obtained from the review of existing subsurface data. The recommendations contained in this letter are at best preliminary in nature and must be confirmed with actual subsurface explorations, laboratory testing, and geotechnical analyses.

Our letter has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Lamoureux Pagano & Associates, Inc. for the specific application to the proposed Doherty High School at the Doherty Site in Worcester, Massachusetts as conceived at this time.

If you have any questions or need further assistance, please contact us at (978) 330-5912.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

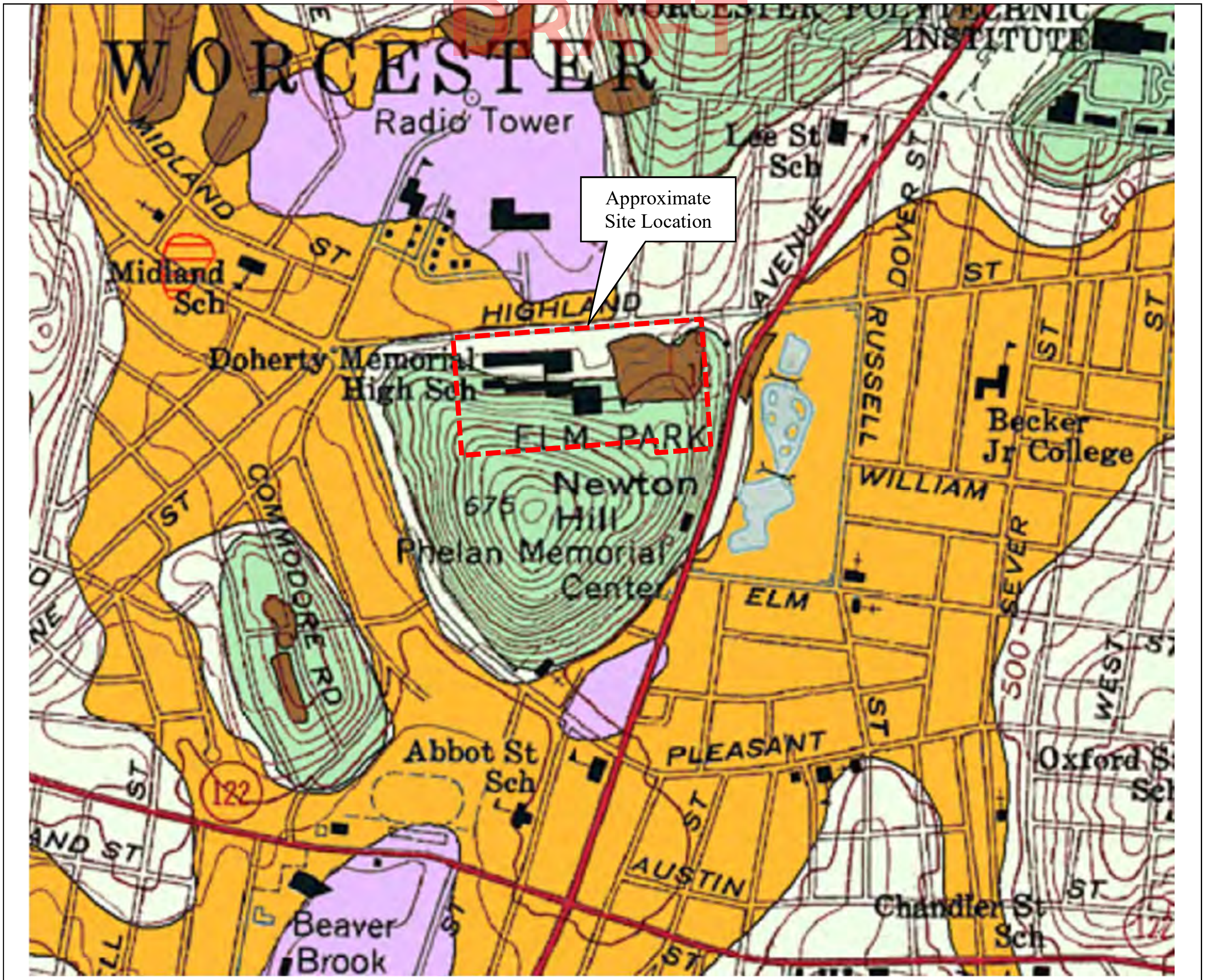
Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

Attachments: Figure 1 – Site Location Map
Figure 2 – Surficial Geologic Map
Attachment A – Historical Topo Maps
Attachment B – Photographs
Attachment C – Excerpts of Soil Survey Report
Attachment D – Locations and Logs of Previous Borings

Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client:	Project:		
Lamoureux Pagano & Associates, Inc.	Proposed Doherty High School	Figure 1 – Site Location Map (Doherty Site)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019



🟫 **Artificial fill**—Earth materials and manmade materials that have been artificially emplaced, primarily in highway and railroad embankments and in dams; unit may also include landfills, urban-development areas, and filled coastal wetlands

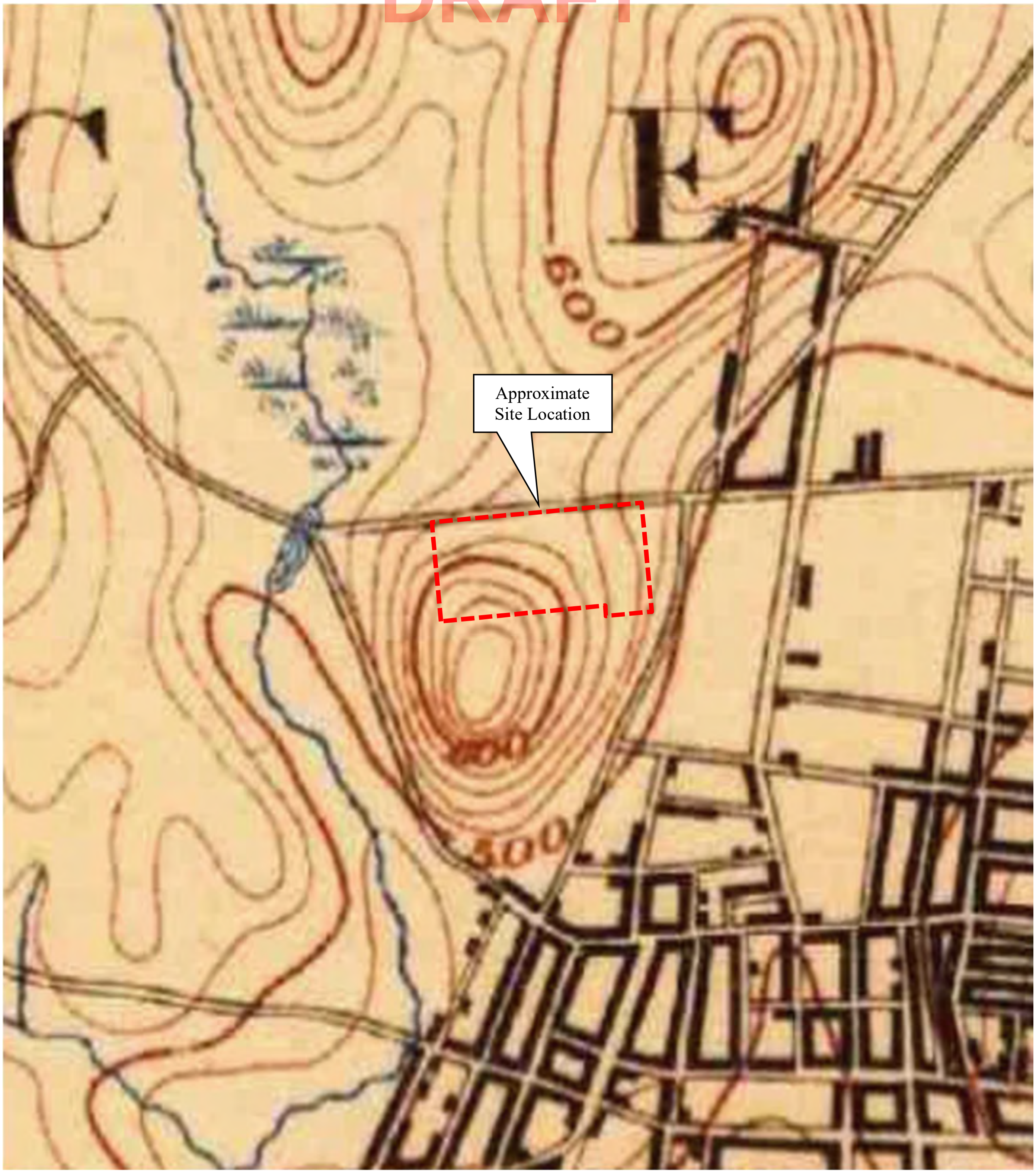
🟩 **Thin till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts, large surface boulders are common, unit was mapped where till is generally less than 10 to 15 ft thick including areas of shallow bedrock. Predominantly consists of upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser grained ablation facies, melted out from supraglacial position, and an underlying more compact, finer grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarse-grained crystalline rocks. Across Massachusetts, fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut Valley lowland, marble in the western river valleys, and fine-grained schists in upland areas

🟩 **Thick till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebbles, cobbles, and boulders in the shallow subsurface; at greater depths consists of compact, nonsorted matrix of silt, very fine sand, and some clay containing scattered small gravel clasts. Mapped in areas where till is greater than 10 to 15 ft thick, mostly in drumlin landforms in which till thickness commonly exceeds 100 ft (maximum recorded thickness is 230 ft). Although upper till of late Wisconsinan age is the surface deposit, lower till of probable Illinoian age constitutes the bulk of the material in thick-till areas. Lower till is moderately to very compact and is commonly finer grained and less stony than upper till. An oxidized zone, the lower part of a soil profile formed during a period of interglacial weathering, is generally present in the upper part of the lower till. This zone commonly shows closely spaced joints that are stained with iron and manganese oxides

Figure based on map titled: “Surficial Materials Map of the North Worcester, Massachusetts,” prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 126 – North Worcester.

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure 2 – Surficial Geologic Map (Doherty Site)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019

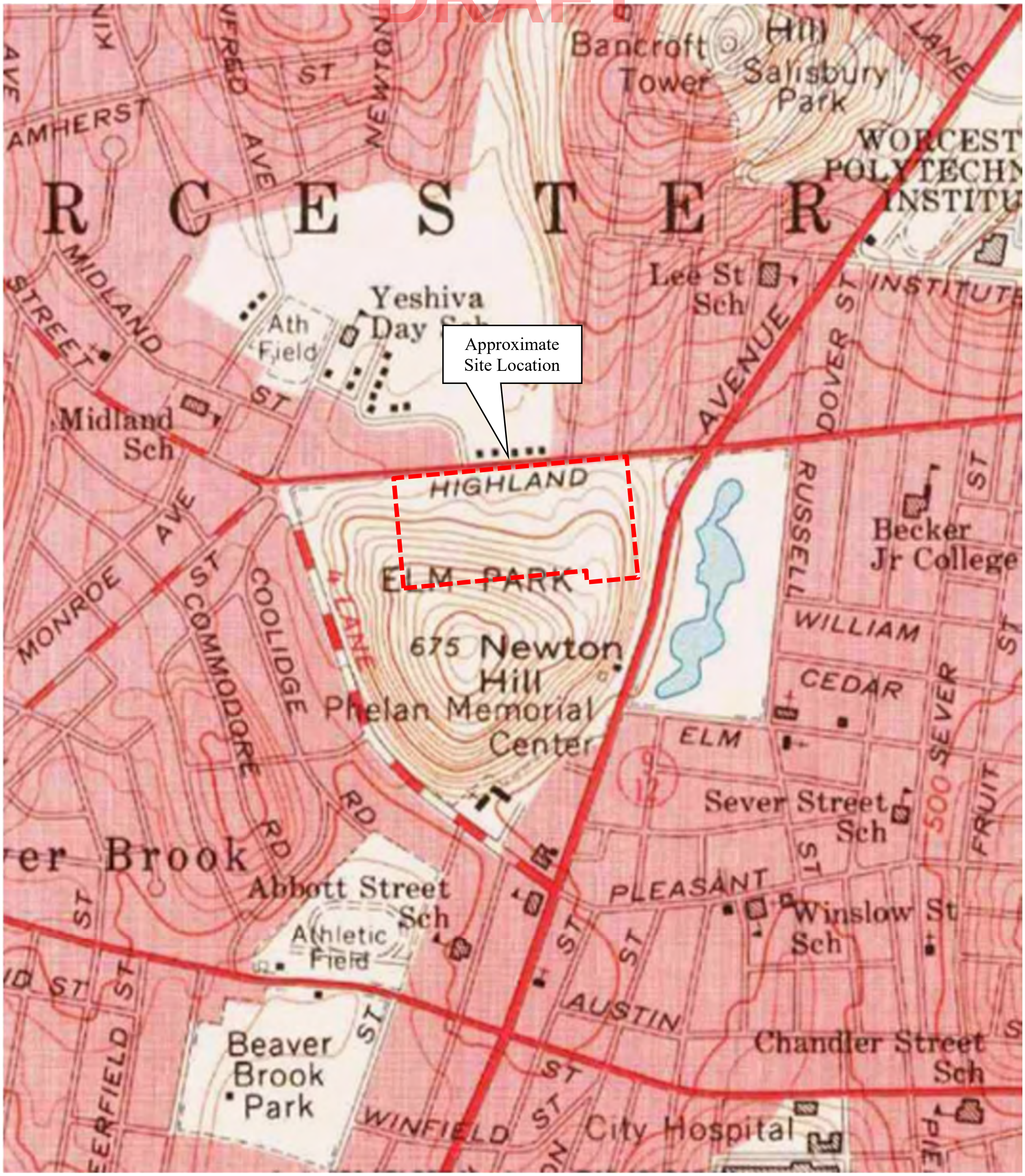
Attachment A – Historical Topo Maps



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure A1 – 1886 Historical Topo Map (Doherty Site)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client:
Lamoureux Pagano & Associates, Inc.

Project:
Proposed Doherty High School

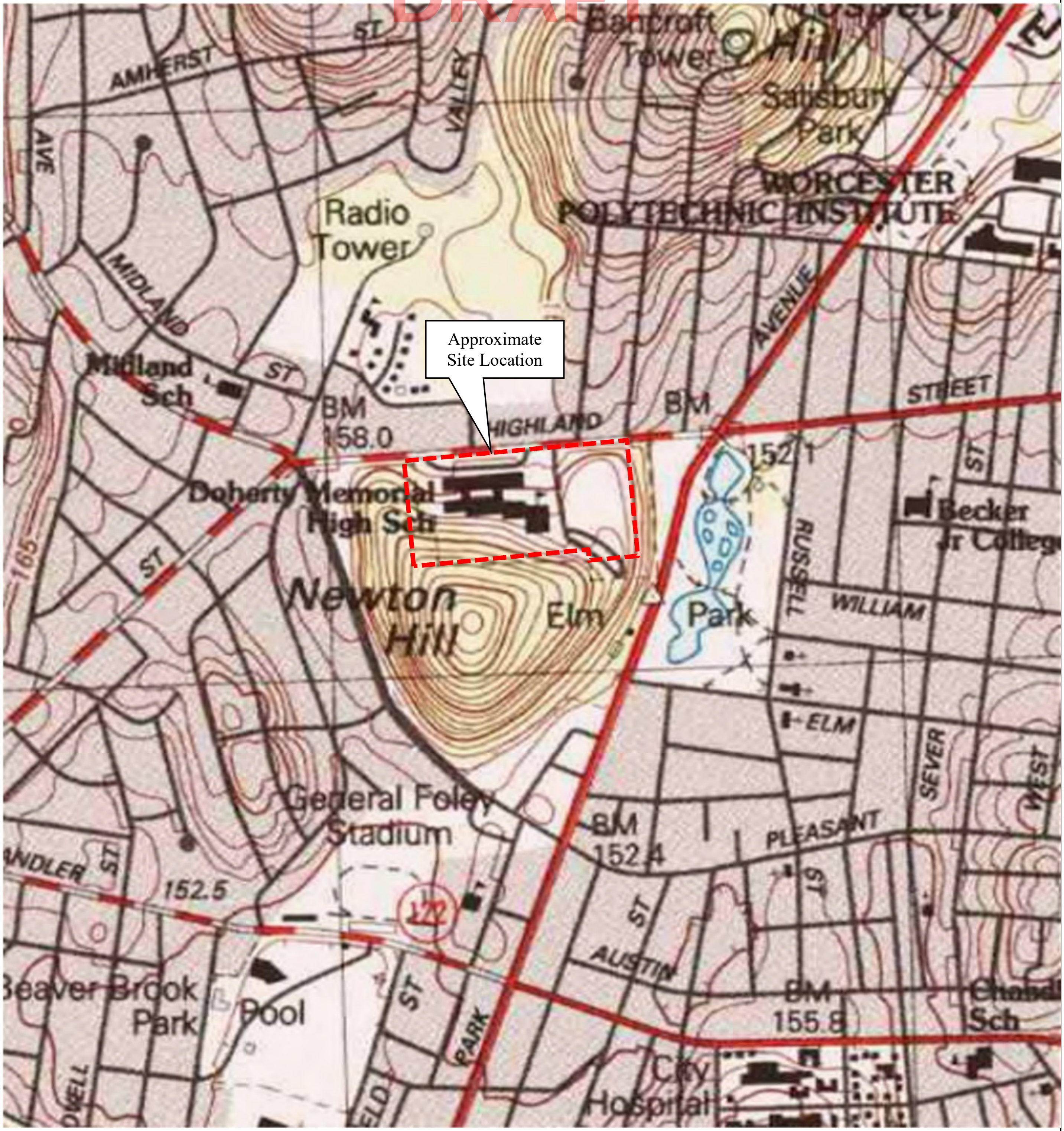
Figure A2 – 1960 Historical Topo Map (Doherty Site)

LGCI
Lahlaf Geotechnical Consulting, Inc.

Project Location:
Worcester, MA

LGCI Project No.:
1922

Date:
Nov. 2019



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School		Figure A3 – 1983 Historical Topo Map (Doherty Site)
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019

Attachment B – Photographs

Photo No. 1: Drop in the grade from the existing parking lot to Highland Street (Looking north)

Photo No. 2: Asphalt condition in the existing parking lot to the existing building

Photo No. 3: Steep rise in the grade from the parking lot to the existing wooded area South of the deexciting parking lot and building

Photo No. 4: Close up of the sharp rise in grade within the wooded area south of the existing parking lot and building

Photo No. 5: View facing north showing the flat existing athletic fields covered with snow

Photo No. 6: View facing Northeast showing the rest of the existing athletic fields

Photo No. 7: View facing northwest showing the existing athletic fields

Photo No. 8: Panoramic view of the existing athletic fields

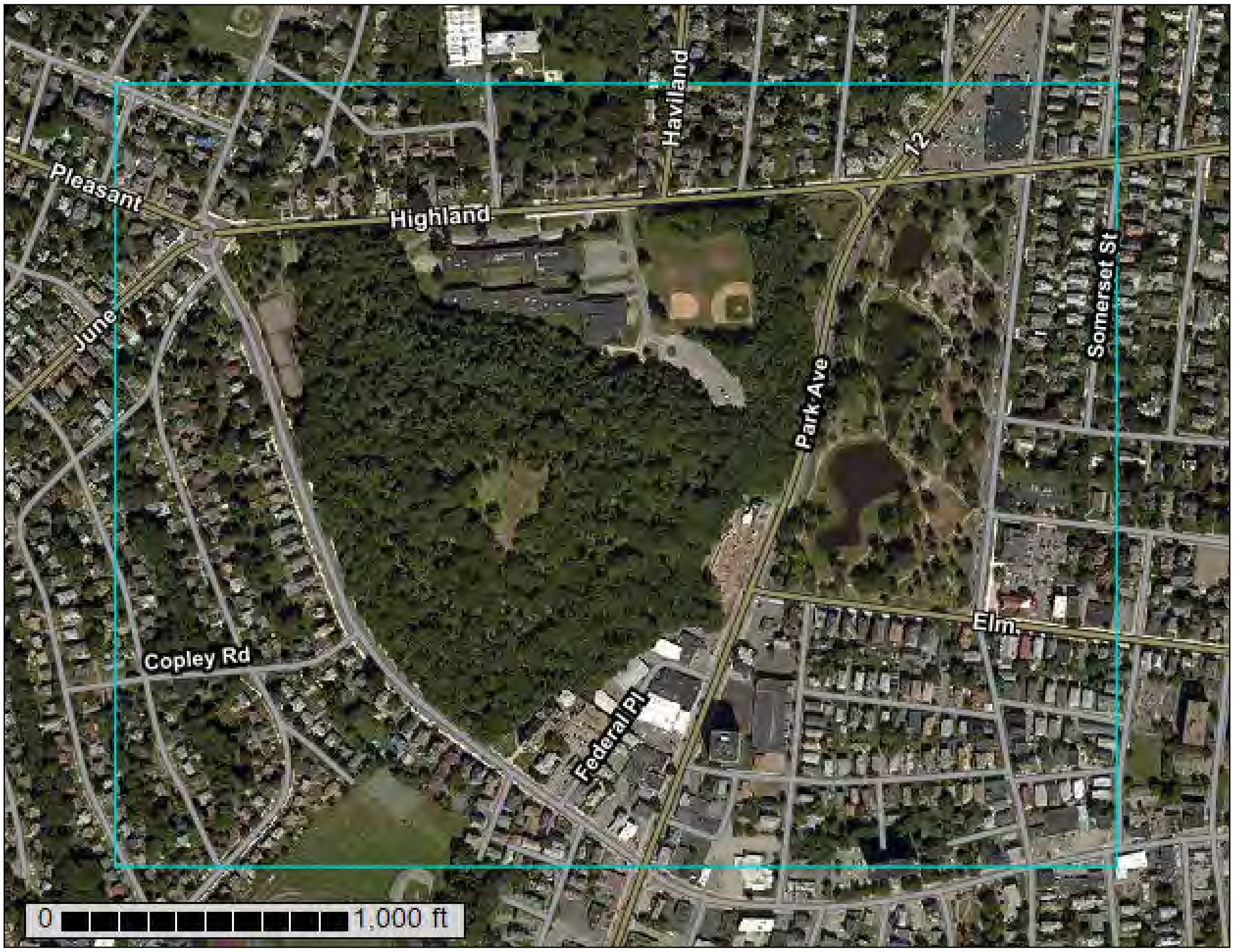
Attachment C – Excerpts of Soil Survey Report

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Worcester County, Massachusetts, Northeastern Part



November 15, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:7,070 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- ▭ Soil Map Unit Polygons
- 〰 Soil Map Unit Lines
- ■ Soil Map Unit Points

Special Point Features

- ◎ Blowout
- ⊠ Borrow Pit
- ✱ Clay Spot
- ◇ Closed Depression
- ✕ Gravel Pit
- ∴ Gravelly Spot
- ● Landfill
- ⋀ Lava Flow
- ⫫ Marsh or swamp
- ⚒ Mine or Quarry
- ◎ Miscellaneous Water
- ○ Perennial Water
- ∨ Rock Outcrop
- + Saline Spot
- ⁘ Sandy Spot
- ≡ Severely Eroded Spot
- ◇ Sinkhole
- ⊳ Slide or Slip
- ⌀ Sodic Spot
- ≣ Spoil Area
- ● Stony Spot
- ● Very Stony Spot
- ψ Wet Spot
- △ Other
- ‐ Special Line Features

Water Features

- ∼ Streams and Canals

Transportation

- ┼┼┼ Rails
- 〰 Interstate Highways
- 〰 US Routes
- 〰 Major Roads
- 〰 Local Roads

Background

- ■ Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 14, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	4.9	2.2%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	42.4	19.1%
602	Urban land	119.2	53.9%
622C	Paxton-Urban land complex, 8 to 15 percent slopes	8.1	3.7%
625C	Hinckley-Urban land complex, 0 to 15 percent slopes	35.8	16.2%
651	Udorthents, smoothed	10.9	4.9%
Totals for Area of Interest		**221.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Worcester County, Massachusetts, Northeastern Part

1—Water

Map Unit Setting

National map unit symbol: w3qb
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Properties and qualities

Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

305D—Paxton fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2w67j
Elevation: 0 to 1,450 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam

Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 6 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent
Landform: Drumlins, drainageways, ground moraines, depressions, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

602—Urban land

Map Unit Setting

National map unit symbol: w3q8
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land

622C—Paxton-Urban land complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w67n
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 45 percent
Urban land: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 9 percent
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Canton

Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 3 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent
Landform: Ground moraines, depressions, hills, drumlins, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: Yes

625C—Hinckley-Urban land complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm1
Elevation: 140 to 770 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 45 percent
Urban land: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Kame terraces, outwash plains, moraines, outwash deltas, kames, eskers, outwash terraces
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope, summit
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave

Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

A - 0 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 10 percent
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Outwash terraces, moraines, outwash plains, kame terraces, kames, eskers

Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope, head slope, riser, tread
Down-slope shape: Convex, concave, linear
Across-slope shape: Concave, convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Eskers, kame terraces, outwash plains, outwash deltas, moraines, kames, outwash terraces
Landform position (two-dimensional): Footslope, shoulder, toeslope, backslope, summit
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Linear, concave, convex
Hydric soil rating: No

651—Udorthents, smoothed

Map Unit Setting

National map unit symbol: w3q6
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 80 percent
Urban land: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Parent material: Made land over firm loamy basal till

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Urban Land

Properties and qualities

Depth to restrictive feature: More than 80 inches

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

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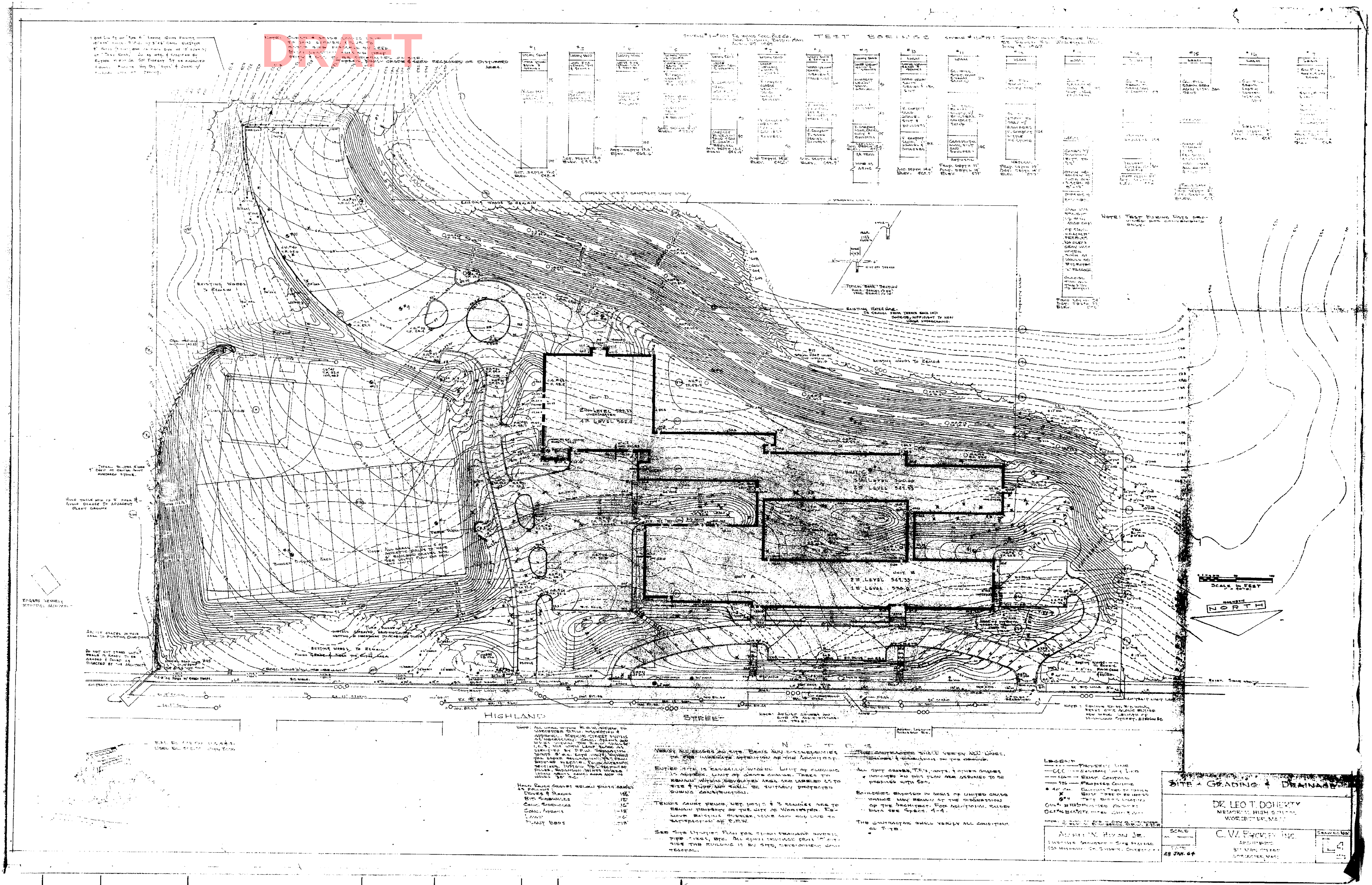
Attachment D – Locations and Logs of Previous Borings



N O T E S

VERIFY ALL GRADES ON SITE. BRING ANY DISCREPANCIES TO THE IMMEDIATE ATTENTION OF THE ARCHITECT.

ENTIRE SITE IS BASICALLY WOODED. LIMIT OF CLEARING IS APPROX. LIMIT OF GRADE CHANGE. TREES TO REMAIN WITHIN DEVELOPED AREA ARE LABELED AS TO SIZE & TYPE AND SHALL BE SUITABLY PROTECTED DURING CONSTRUCTION.

TENNIS COURT FENCE, NET POSTS & 3 BENCHES ARE TO REMAIN PROPERTY OF THE CITY OF WORCESTER. REMOVE EXISTING BUBBLER, VALVE AND CAP LINE TO SATISFACTION OF D.P.W.

SEE SITE UTILITIES PLAN FOR STORM DRAINAGE INVERTS, PIPE SIZES, ETC. ALL STORM DRAINAGE FROM 10' OUTSIDE THE BUILDING IS BY SITE DEVELOPMENT CONTRACTOR.

THE CONTRACTOR SHALL VERIFY ALL LINES, GRADES & DIMENSIONS ON THE GROUND.

ALL SPOT GRADES, T.E.'S, INVTS. & OTHER GRADES INDICATED ON THIS PLAN ARE ASSUMED TO BE PREFIXED WITH 500.

BOULDERS EXPOSED IN AREAS OF LIMITED GRADE CHANGE MAY REMAIN AT THE DISCRETION OF THE ARCHITECT. FOR ADDITIONAL BOULDER DATA SEE SPEC. 4-4.

THE CONTRACTOR SHALL VERIFY ALL CONDITIONS ON SITE.

LEGEND
- PROPERTY LINE
- CCC CONTRACT LIMIT LINE
- 526 EXIST. CONTOUR
- 526 PROPOSED CONTOUR
- ● EXISTING TREE TO REMAIN
- ✕ EXIST. TREE TO BE REMOVED
- ⊕ TEST BORING LOCATION

SITE & GRADING & DRAINAGE

DR. LEO T. DOHERTY
MEMORIAL HIGH SCHOOL
WORCESTER, MASS.

ALBERT N. HIXON JR.
LANDSCAPE ARCHITECT – SITE PLANNER

SCALE

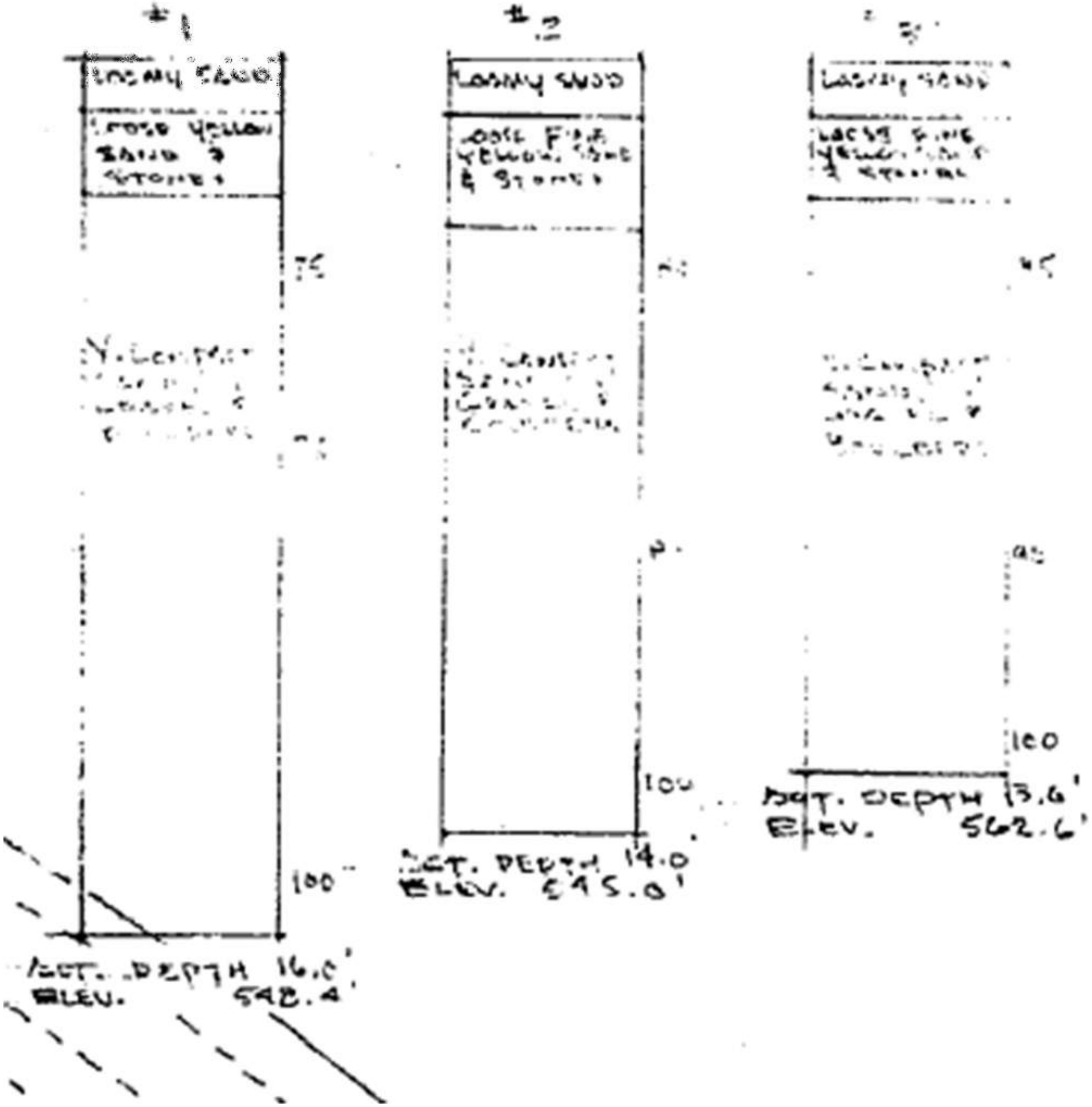
DATE 28 JAN. 64

C. W. BUCKLEY INC.
ARCHITECTS
WORCESTER, MASS.

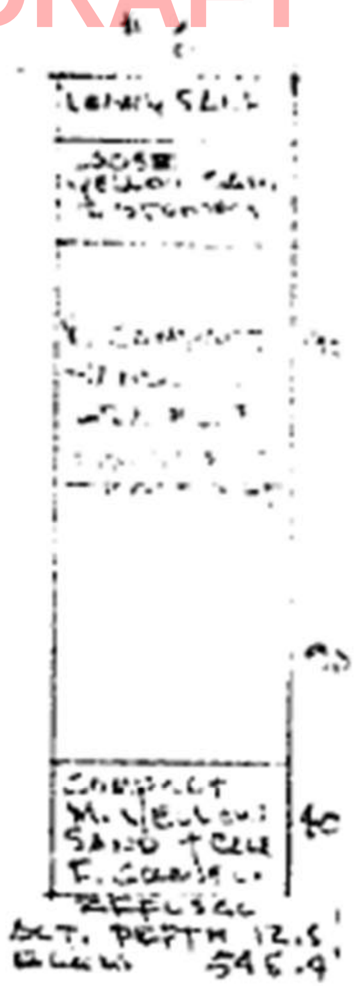
DRAWING NO. L4

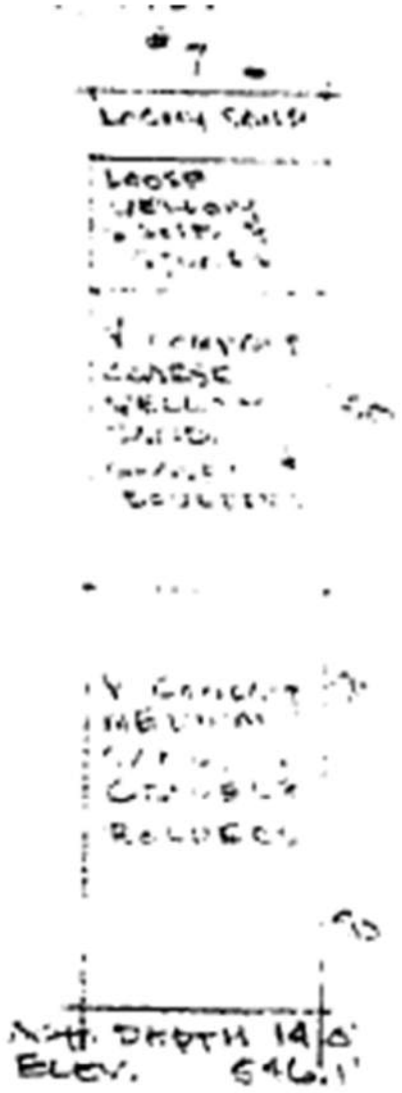
1922 Proposed Doherty High School

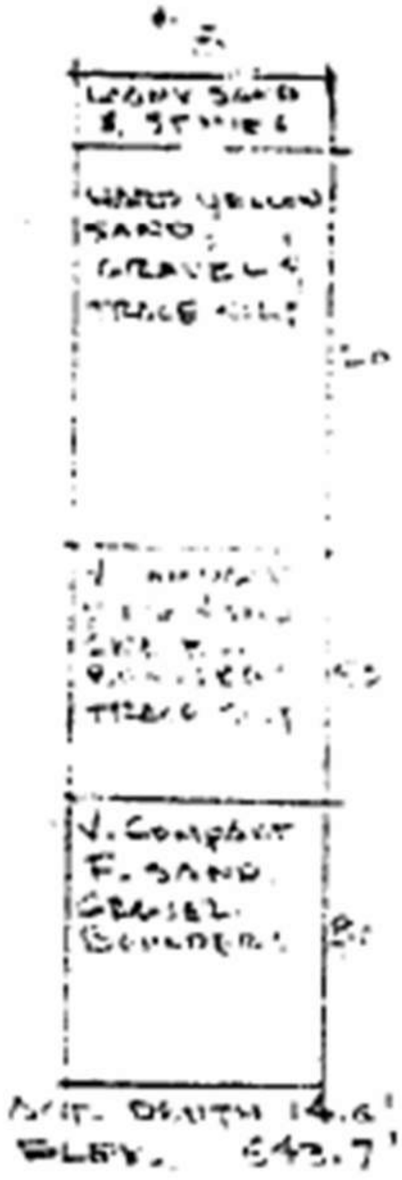
Doherty Site Boring Logs

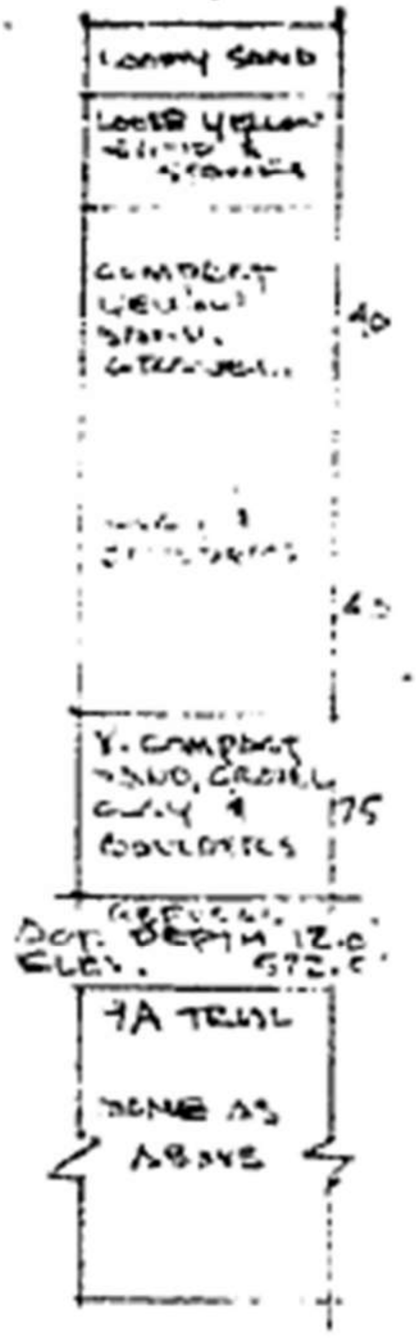


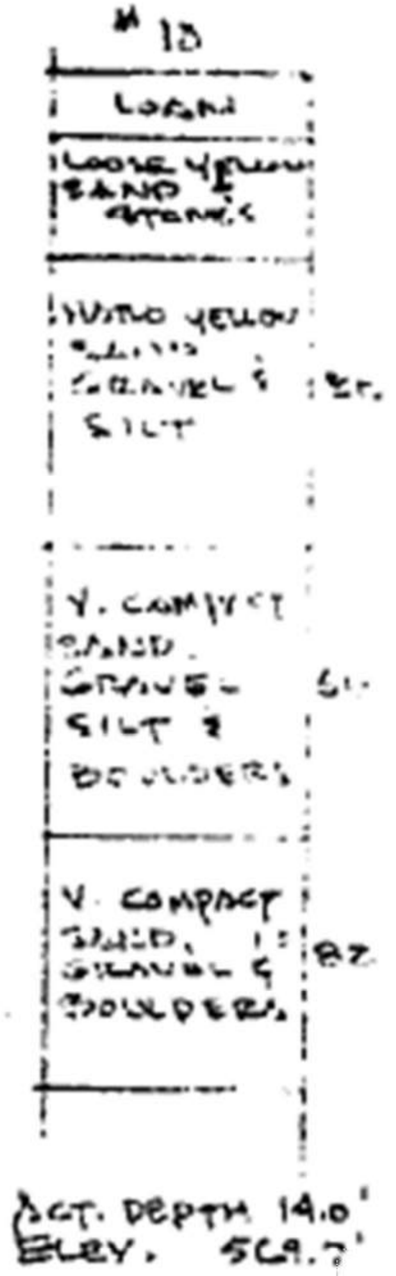

5
LOAMY SAND
LOOSE YELLOW
SAND &
BOULDERS
V. COMPACT
YELLOW
& BOULDERS
ACT. DEPTH
ELEV.

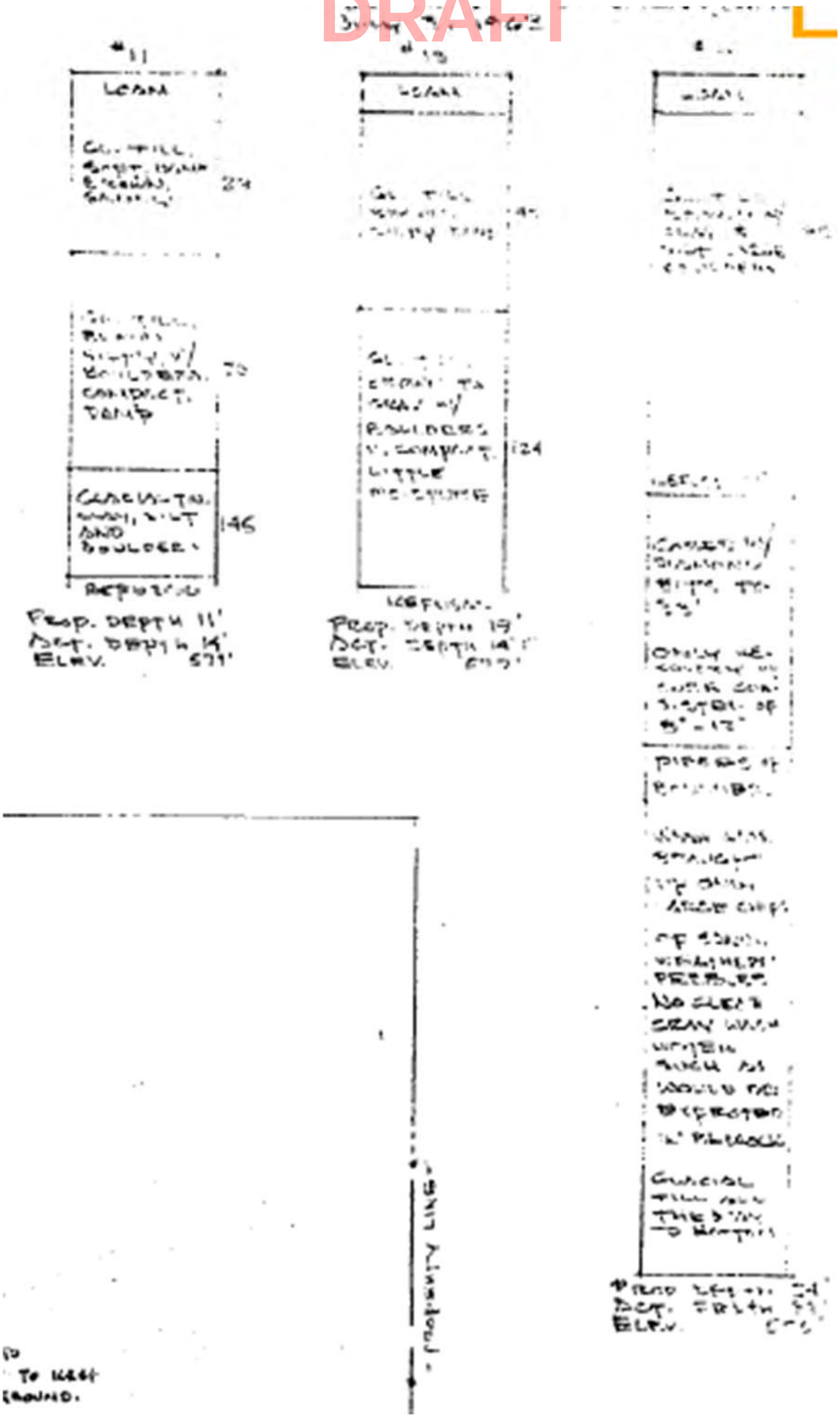

6
LOAMY SAND
LOOSE
YELLOW SAND
BOULDERS
V. COMPACT
50
COMPACT
M. YELLOW
SAND + CLAY
F. GRAVEL
40
REFUSAL
ACT. DEPTH 12.5'
ELEV. 545.4'

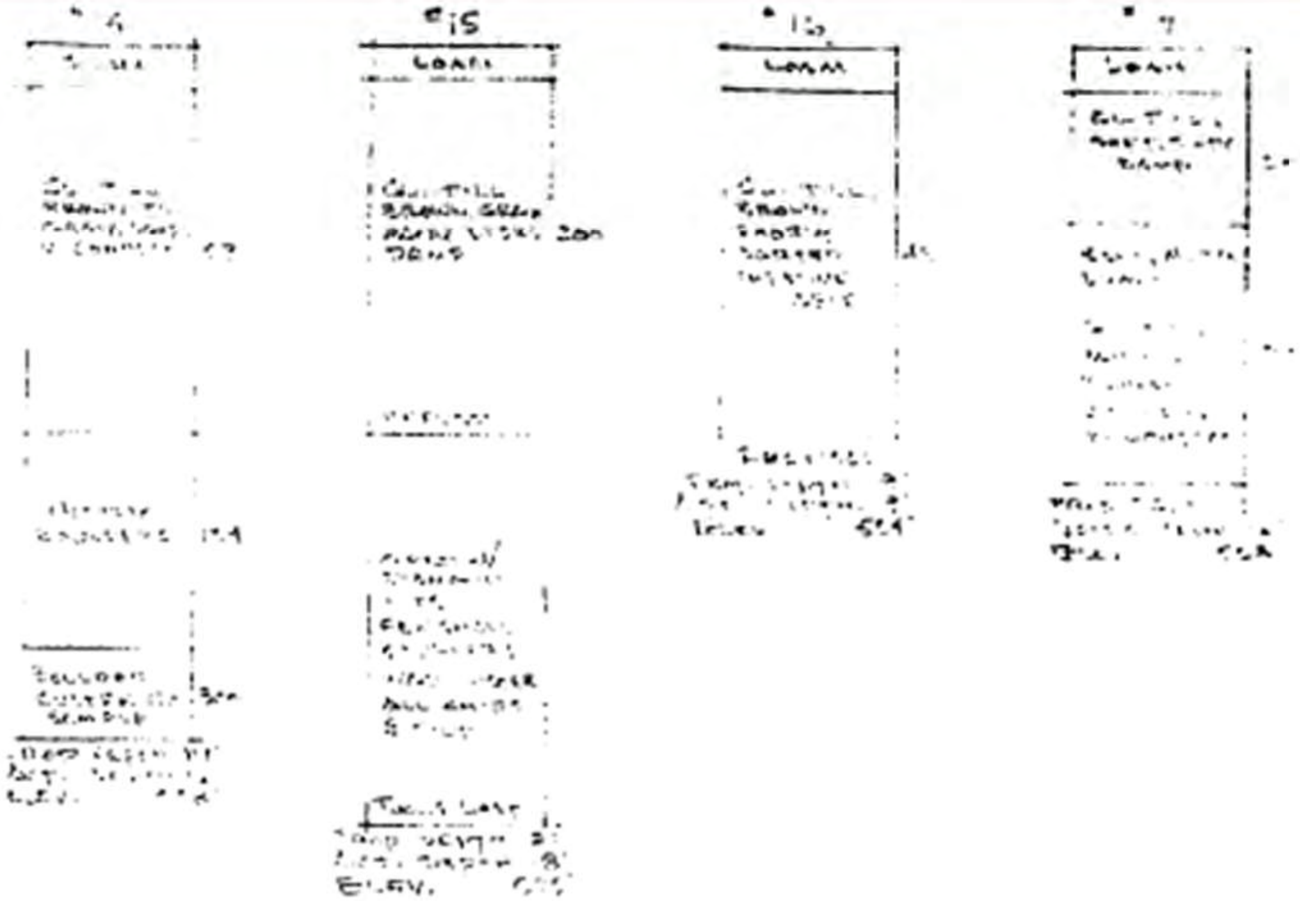

7
LOAMY SAND
LOOSE
YELLOW
V. COMPACT
COARSE
YELLOW
SAND
BOULDERS
V. COMPACT
MEDIUM
BOULDERS
ACT. DEPTH 14.0'
ELEV. 546.1'


#2
LOAMY SAND & STONES
HARD YELLOW SAND, GRAVEL & TRACE SILT
V. COMPACT SAND, BOULDERS TRACE SILT
V. COMPACT F. SAND, GRAVEL BOULDERS
ACT. DEPTH 14.6'
ELEV. 543.7'


#3
LOAMY SAND
LOOSE YELLOW SAND & STONES
COMPACT YELLOW SAND, GRAVEL
40
SAND & BOULDERS
45
V. COMPACT SAND, GRAVEL, CLAY & BOULDERS
75
GRAVEL
ACT. DEPTH 12.0'
ELEV. 572.5'
4A TRIAL
SAME AS ABOVE


#10
LOAM
LOOSE YELLOW SAND & STONES
HARD YELLOW SAND, GRAVEL & SILT
V. COMPACT SAND, GRAVEL, SILT & BOULDERS
V. COMPACT SAND, GRAVEL & BOULDERS
82
ACT. DEPTH 14.0'
ELEV. 569.7'


#11
LOAM
24
70
GLACIAL TILL, SILT AND BOULDERS
146
REFUSAL
PROP. DEPTH 11'
ELEV. 571'
#13
LOAM
45
BOULDERS
LITTLE MOISTURE
124
REFUSAL
PROP. DEPTH 19'
ELEV.
LOAM
GLACIAL
PROP. DEPTH
ELEV.
PROPERTY LINE
TO WEST
GROUND.


#15
LOAM
BROWN GRAY
LOAM
LOAM
LOAM
ELEV.

LGCI
Lahlaf Geotechnical Consulting, Inc.

December 9, 2019

Mr. Robert Para Jr., AIA
Lamoureux Pagano & Associates, Inc.
108 Grove Street, Suite 300
Worcester, MA 01605
Tel: (508) 752-2831
Fax: (508) 757-7769
E-mail: RPara@lpaa.com

Re: Preliminary Geotechnical Review Services
Proposed Doherty High School
Foley Stadium Site
Worcester, Massachusetts
LGCI Project No. 1922

Dear Mr. Para:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has performed a site visit and completed a preliminary review of the geotechnical data available for the Commerce Bank Field at Foley Stadium (Foley Site) in relation to the proposed Doherty High School in Worcester, Massachusetts. Our services were performed in accordance with our proposal No. 19087 dated October 14, 2019. Ms. Kathryn Crockett of Lamoureux Pagano & Associates, Inc. (LPA) authorized our services by signing our proposal on November 13, 2019

This letter includes a summary of our field observations, a summary of the subsurface data we reviewed, our opinion about possible foundation issues during construction, and our recommendations for subsurface explorations.

1. Reviewed Documents

LGCI reviewed the following documents:

- "Custom Soil Resource Report for Worcester County, Massachusetts, Northeastern Part," (Soil Survey Report) National Cooperative Soil Survey/National Resources Conservation Services, USDA (Map and soil description printed November 15, 2019 from https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx).

- "Surficial Materials Map of the North Worcester, Massachusetts," prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 126 – North Worcester.

- "Topographic Plan, Foley Stadium, Chandler Street, Worcester, Mass." (Site Plan) Prepared by R.E. Cameron A Associates, Inc. of Norwood, MA and provided to us via e-mail by LPA on October 31, 2019.

- Plan showing locations of borings performed at the site in 1963 (1963 Boring Location Plan), provided to us by LPA via e-mail on July 30, 2019.

- Logs of soil borings performed at the site in 1963 (1963 Boring Logs), provided to us by LPA via e-mail on July 30, 2019.

- Logs of borings advanced at the Foley Stadium in February 1963 and boring locations provided to us by LPA via e-mail on July 30, 2019.

- Plan showing locations of soil probes (Probe Location Plan), prepared by CDM, performed in 2006, provided to us by LPA via e-mail on August 23, 2019.

- Logs of probes prepared by CDM (2006 Probe Logs), provided to us by LPA via e-mail on August 23, 2019.

- Sketch showing concept plan titled: “3.3.3 - Final Evaluation of Alternatives, Preliminary Design Options, Option B.1 - New Construction on Foley Stadium Site (Proposed Scheme), provided to us by LPA via e-mail on December 6, 2019.

- Sketches showing preliminary grading (Preliminary Grading Plans) provided to us by LPA via e-mail December 6, 2019.

2. Site Location Description

We understand that one of the sites being considered for the proposed Doherty High School is the Foley Site located at 325 Chandler Street in Worcester, Massachusetts as shown in Figure 1. This is an active sports complex that includes a football field with track, a grandstand, a baseball field, a grass practice field, a garage, and a field house. The site has frontage on Chandler Street. The site is bordered by residential properties on northern side (Pleasant Street) side; by Norman Avenue, Abbott Street, and private properties on the eastern side; by residential properties on the western (Coolidge Road) side; and by Chandler Street (Route 122) on the southern side.

Based on the Site Plan, utilities at the site include drain lines and overhead wires. The Site Plan also shows an 84-inch drain line (Beaver Brook Culvert) crossing the site in a nearly north south direction. The Site Plan indicates that the grades at the site generally slope up gently from about El. 485 feet on the southern side near Chandler Street to El. 493 feet near the northernmost corner of the site and to about El. 501 feet on the eastern side near Abbott Street.

We understand that the site was constructed in 1927. Based on historical topographic maps, included in Attachment A, a river used to cross the site. The maps show that the site was filled sometime between 1908 and 1934. The existing culvert crossing the site channels the water from Beaver Brook. You indicated to us that the grandstands and nearby buildings are supported on piles.

3. Project Description

We understand that the City of Worcester is considering the Foley Site as one of three possible sites for the proposed Doherty High School. We understand that if the Foley Site is selected, the proposed construction would consist of a high school building on the southern side of the site near Chandler Street, i.e., within the area of the existing grandstands and football field.

Based on the Proposed Scheme, the proposed building will consist of two wings configured in a fan-shape and connected on their southern sides. Based on the Preliminary Grading Plans, the proposed building will have a footprint of between 155,000 and 160,000 square feet and will be five stories high. Based on the Site Plan, the existing grades range between about El. 185 feet on the southern side and El. 189 feet on the northern side of the proposed building footprint. Based on the Proposed Scheme and the Preliminary Grading Plans, we understand that the proposed floors will be configured as follows:

- The first floor of the proposed building will be partially below-ground and will extend over only a portion of the proposed building on the western side. The first floor will have a finished floor elevation (FFE) of El. 485 feet; thus, requiring cuts up to 4 feet to achieve the proposed FFE. The area east of the first floor will not be excavated.
- The second and third floors of the proposed building will extend over the entire footprint of the proposed building and will have FFEs of El. 500 feet and El. 520 feet, respectively.
- The fourth floor of the proposed building will extend over the northern portion of the proposed building footprint while its southern portion will be a roof. The fourth floor will have an FFE of El. 535 feet.
- The fifth floor of the proposed building will only extend over the northeastern portion of the proposed building footprint and will have an FFE of El. 550 feet.

The proposed athletic fields will be located on the northern side of the site, north of the proposed building.

Based on the Proposed Grading Plan, the proposed exterior grade will be about El. 490 feet around the proposed building and will gently rise to about El. 500 feet on the eastern side near Abbott Street. The proposed athletic fields will have finished grades at about El. 492 feet. Based on the proposed grades, little cuts and fill will be required to achieve the proposed grades.

Field Observations

An LGCI representative visited the site on December 5, 2019. The purpose of our visit was to observe site features such as wet areas, and other features that may impact construction. Photographs taken during our site visit are included in Attachment A.

The site was mostly covered with about one foot of snow at the time of our visit and site features were concealed by the snow.

The exposed surface visible at the time of our visit such as the parking lot on the western side of the grandstands and the concrete walkway just north of the grandstands showed no evidence of gross settlement. Cracks in the concrete slabs near the entrance were observed. We also did not observe evidence of settlement between the ground surface adjacent to the grandstands and the grandstands' foundation. It is not known whether the ground around the pile-supported grandstands was regraded over time as a result of settlement of ground. Photographs of the sites are included in Attachment B.

4. Summary of Existing Subsurface Data

Soil Survey Report – Based on the Soil Survey Report listed in Section 1, the soils at the site are classified primarily as Urban Land and Smoothed Udorthents. Urban Land is defined as excavated and filled land. Udorthents are defined as "made land over firm loamy basal till." The Soil Survey Report does not include the thickness of the A and B horizons. However, it includes a depth to groundwater that is deeper than 80 inches.

A copy of the Soil Survey Report and Map are included in Attachment C.

Surficial Geologic Map – The Surficial Geologic Map (listed in Section 1) indicates that the natural soils in the general vicinity of the site consist of swamp deposits and coarse deposits. Based on the Surficial Geologic Map, the swamp deposits consist of organic muck and peat that contain minor amounts of sand, silt, and clay. The Surficial Geologic Map indicates that the swamp deposits are present on the southern side of the site. The coarse deposits consist of gravel deposits, sand and gravel deposits, and sand deposits. These deposits are present on the northern side of the site.

The Surficial Geologic Map of the site is shown in Figure 2.

Previous Explorations – Based on the 1963 Boring Location Plan, fourteen (14) borings were advanced at the site in 1963. You provided us with the logs of nine (9) of the 1963 borings (Boring-1 to Boring-9). Borings Boring-1 to Boring-9 were advanced within and near the footprint of the existing grandstand and extended to depths ranging between 7 and 30 feet beneath the ground surface.

You also provided us with the logs of twenty-nine (29) probes that were advanced at the site by CDM in 2006. The locations of nineteen (19) of these probes (CDM-1 to CDM-19), advanced in the football field north of the existing grandstands, are shown in the Probe Location Plan. The locations of probes CDM-20 to CDM-29 are not shown on the Probe Location Plan. Probes CDM-1 to CDM-29 were advanced to depths ranging between 5 and 15 feet beneath the ground surface.

The locations of the 1963 borings and the 2006 probes, and the logs you provided to us are included in Attachment D.

The soil strata encountered in the borings and probes were as follows, starting at the ground surface.

Topsoil – A layer of topsoil was encountered at the ground surface in borings Boring-1 to Boring-9 and in probes CDM-1 to CDM-29. The topsoil extended to depths ranging between 0.5 and 3.8 feet beneath the ground surface. The topsoil was generally described as silt in the probes and as loam in the borings. The topsoil contained traces of roots.

Fill – A layer of fill was encountered at the ground surface or beneath the topsoil in borings Boring-1 to Boring-4, Boring-6, and Boring-8 and probes CDM-1 to CDM-28. The fill extended to the termination depth of boring Boring-2 and probes CDM-1, CDM-2 to CDM-5, CDM-7 to CDM-10, CDM-12 to CDM-14, CDM-16, CDM-17, and CDM-26 to CDM-29 at depths ranging between 5 and 7 feet beneath the ground surface. In Boring-1, Boring-3, Boring-4, Boring-6, and Boring-8 and in probes CDM-2, CDM-6, CDM-11, CDM-15, CDM-18 to CDM-25, the fill extended to the top of the silt, organic silt, and sand and gravel layers at depths ranging between 3.8 and 12.5 feet beneath the ground surface. In the borings, the fill was described as loose or firm fill. In the probes, the fill consisted of a heterogenous mixture of gravel, sand, silt, and clay and contained traces of silt, coal ash, ash, brick, and glass. In a few probes, the samples consisted mostly or entirely of coal ash and brick.

The standard penetration test (SPT) N-values in the fill ranged between 1 and 235 blows per foot (bpf), with most values ranging between 1 and 30 bpf, indicating mostly very loose to medium dense material. The high SPT N-values may have been caused by obstructions in the fill.

Silt/Organic Silt/Silty Clay/Sand and Gravel – Layers of interbedded silt, silty clay, sand, and gravel were encountered beneath the fill. The silt was described as organic silt in probes CDM-18 to CDM-21 and CDM-25. The organic silt extended to depths ranging between 12.5 and 14.8 feet beneath the ground surface. Two samples in probes CDM-18 and CDM-25 contained peat.

Where encountered, the sand and gravel extended to the probe and boring termination depths. The (SPT) N-values in the sand and gravel layer ranged between 16 and 330 bpf, with most values greater than 30 bpf, indicating mostly dense to very dense material.

Where encountered in the 1963 soil borings and in the 2006 probes, groundwater ranged between depths of 9 and 12 feet beneath the ground surface.

In addition to the exploration logs described above, you provided us with the logs and locations of ten (10) borings (P1-P4, A1, A3, B-4, B-6, C1, and C3), advanced at the existing Beaver Brook Park located across Chandler Street from the site, to depths ranging between 17 and 24 feet beneath the ground surface. These borings generally indicated fill, overlaying peat, overlaying sand. The fill in borings P1, P4, A1, A3, B4, B6, C-1, and C3 was underlain by peat that extended to the termination depths of borings A1, A3, B4, B6, C-1, and C3, at 3 to 24 feet beneath the ground surface. Natural, very loose to medium dense sand was encountered beneath the fill or peat in the borings and extended to the boring termination depths. The Beaver Brook Park borings generally indicated subsurface conditions that were consistent with those observed in the borings and probes advanced at the site.

The subsurface conditions encountered at the site and at the Beaver Brook Park are consistent with the Surficial Geologic Map that indicated the presence of swamp deposits in the general area of the site.

5. Preliminary Recommendations

Please note that the review of available information summarized in this letter is not a substitute for a subsurface exploration program. The information gathered as part of this review may be incomplete and the recommendations derived therefrom are at best preliminary in nature and must be confirmed with actual subsurface explorations, laboratory testing, and geotechnical analyses.

The available subsurface data indicate the presence of fill that extends to depths of up to 12.5 feet beneath the ground surface. The previous borings indicated that the fill is very loose to medium dense. Existing fill that was not placed with strict moisture, density, and gradation control presents the risk of unpredictable settlements that may result in the poor performance of floor slabs and foundations. Organic silt was also encountered beneath the fill. The organic silt to depths of up to 14.8 feet beneath the ground surface. Organic silt left in place underneath the proposed foundations and slabs will result in larger than acceptable settlements. Due to these risks, the existing fill and organic silt are not suitable to support the proposed building.

The proposed building may be supported on deep foundations or on shallow footings bearing on improved ground as described below.

Deep Foundations – The proposed building may be supported on deep foundations. Feasible foundation types include H-piles, concrete-filled steel pipe piles, and pre-stressed concrete piles. H-piles would need to extend to the top of rock. Steel pipe piles and pre-stressed concrete piles could derive their capacity in friction and in end bearing in the sand layer. Micropiles installed with their bond zones in the sand layer are also feasible and offer the advantage of drilling through boulders. The selection of the pile type should be based on the proposed column loads, the subsurface conditions from deep borings, and on cost considerations. When considering a pile foundation, the cost of pile caps and a structural slab should be also be taken into account.

Ground Improvements – We believe that the existing fill and organic soil could be improved using aggregate piers (APs) or rigid inclusions.

APs are typically relatively short, stiff elements of compacted aggregate which improve the existing fill. These elements are typically installed by augering holes ranging from 20 inches to 36 inches in diameter. Aggregate (crushed stone or recycled concrete) is then introduced into the hole and is generally compacted in one-foot lifts by repeated penetrations with the vibrator, which can be mounted to a crane or tracked carrier. The vibratory or ramming energy densifies the aggregate in the element; thus, producing high modulus aggregate piers. The installation of APs also densifies the surrounding soil depending on the type of soil. These high modulus elements reinforce the treatment zone and increase the composite friction angle and stiffness of the reinforced soil mass. Due to the presence of organic soil, if used, the aggregate piers should be grouted to reduce the potential for bulging of the piers in the organic soil. The installation of grouted-APs is similar to conventional AP construction except that grout is introduced into the stone backfill during placement and compaction.

After the ground is improved, the proposed building may be supported on conventional shallow footings, and the proposed slab may be constructed as a slab-on-grade.

The final number, layout, size, and depth of the ground improvement are provided by a professional engineer engaged by the specialty contractor. A modulus test of each type of installed piers will be required before the start of production.

Rigid inclusions (RIs) are a ground improvement technique whereby rigid, cylindrical concrete elements are installed through a soil that is not suitable to support shallow foundations, such as the existing fill, organics, and loose sand and silt at the site. The concrete is installed using a bottom feed from a mandrel as the mandrel is extracted from the ground. After the ground is improved using rigid inclusions, the proposed structure may be supported on shallow foundations, and the slab may be constructed as a slab-on-grade.

6. Recommendations for Subsurface Explorations

We recommend performing additional explorations at the site if this site is selected. The additional explorations should include sixteen (16) to twenty (20) soil borings, including at least six (6) borings to rock, and two (2) groundwater observation wells. The geotechnical explorations should be coordinated with the work of an environmental engineer to pre-characterize the site soils generated from footing and utility excavations and from ground improvement soils, if any, that will need to be disposed of offsite.

7. Limitations

Our letter is based on project information provided to us at the time of this letter. If changes to the type, size, and location of the proposed structure or to the site grading are made, the recommendations contained in this letter shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based solely on these preliminary recommendations.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminates in or around the site.

The recommendations in this letter are based in part on the data obtained from the review of existing subsurface data. The recommendations contained in this letter are at best preliminary in nature and must be confirmed with actual subsurface explorations, laboratory testing, and geotechnical analyses.

Our letter has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Lamoureux Pagano & Associates, Inc. for the specific application to the proposed Foley Stadium Site at the Doherty High School in Worcester, Massachusetts as conceived at this time.

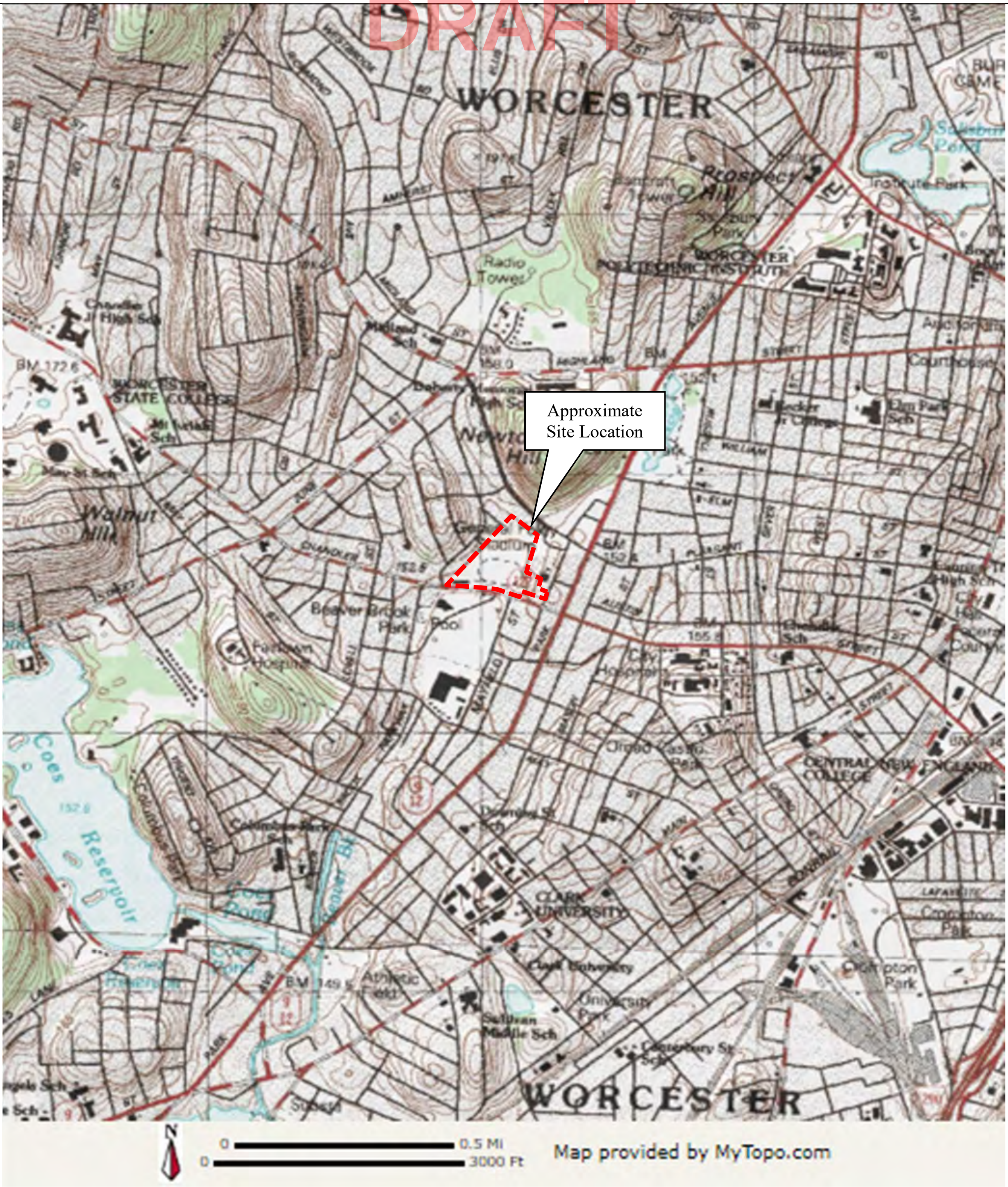
If you have any questions or need further assistance, please contact us at (978) 330-5912.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

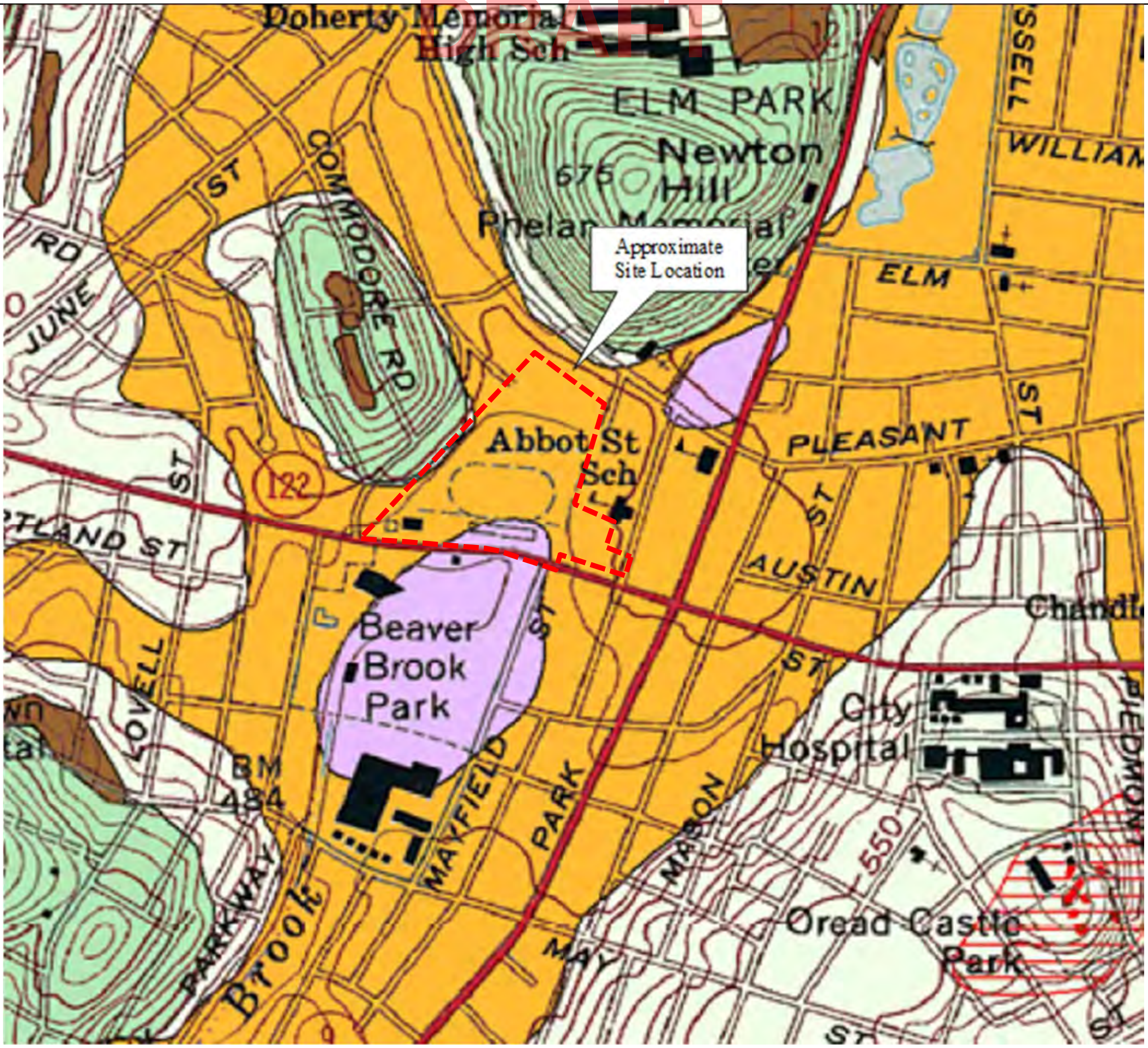
Attachments: Figure 1 – Site Location Map
Figure 2 – Surficial Geologic Map
Attachment A – Historical Topo Maps
Attachment B – Photographs
Attachment C – Excerpts of Soil Survey Report
Attachment D – Locations and Logs of Previous Borings and Probes



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure 1 – Site Location Map (Foley Site)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019



N

🟪 **Swamp deposits**—Organic muck and peat that contain minor amounts of sand, silt, and clay, are stratified and poorly sorted, and occur in swamps and freshwater marshes, in kettle depressions, or in poorly drained areas. Unit is shown only where deposits are estimated to be at least 3 ft thick; most deposits are less than 10 ft thick. Swamp deposits overlie glacial deposits or bedrock. They locally overlie glacial till even where they occur within thin glacial meltwater deposits

🟧 **Coarse deposits** consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

Figure based on map titled: “Surficial Materials Map of the North Worcester, Massachusetts,” prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 126 – North Worcester.

Client:
Lamoureux Pagano & Associates, Inc.

Project:
Proposed Doherty High School

Figure 2 – Surficial Geologic Map (Foley Site)

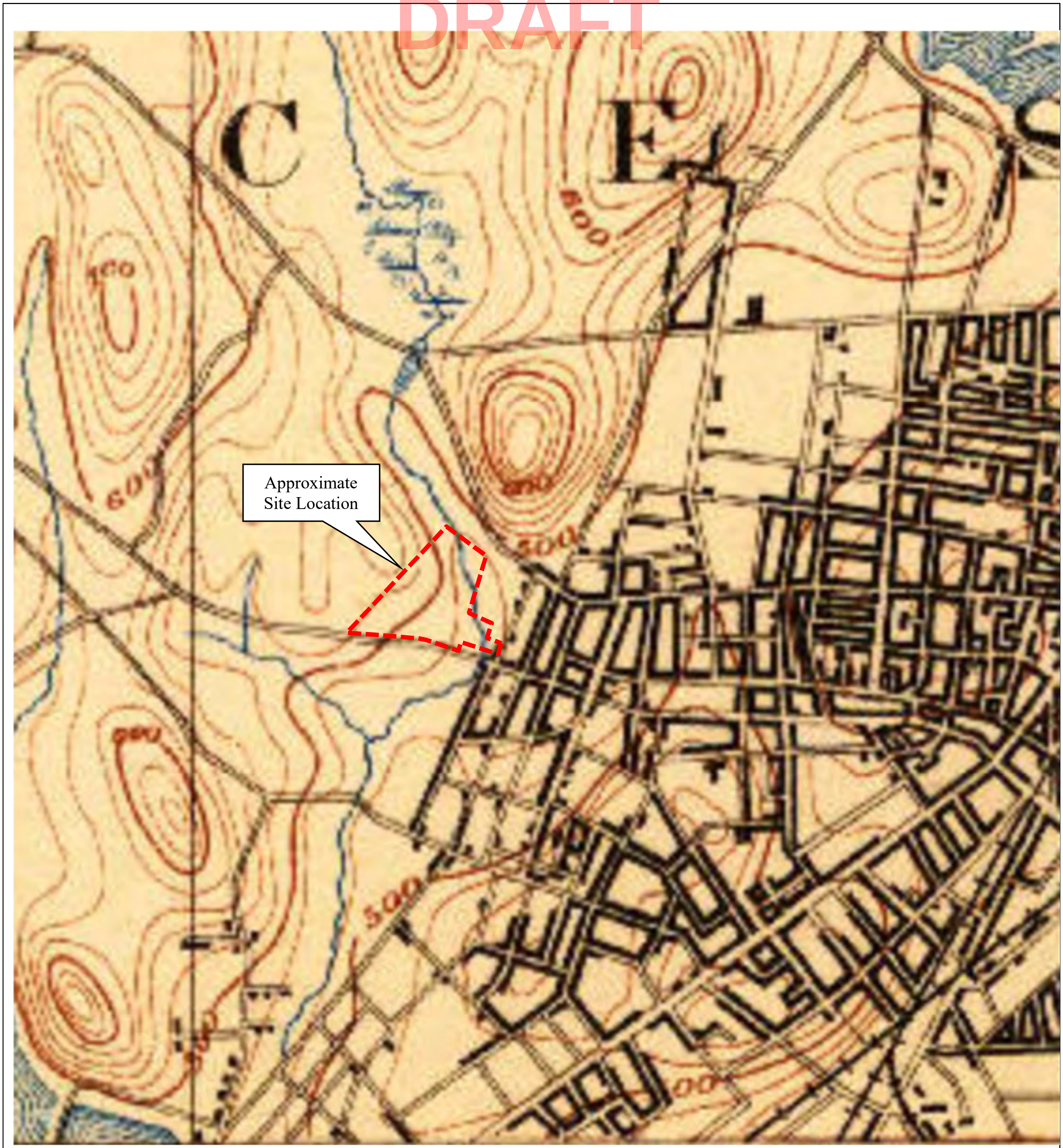
LGCI
Lahlaf Geotechnical Consulting, Inc.

Project Location:
Worcester, MA

LGCI Project No.:
1922

Date:
Nov. 2019

Attachment A – Historical Topo Maps



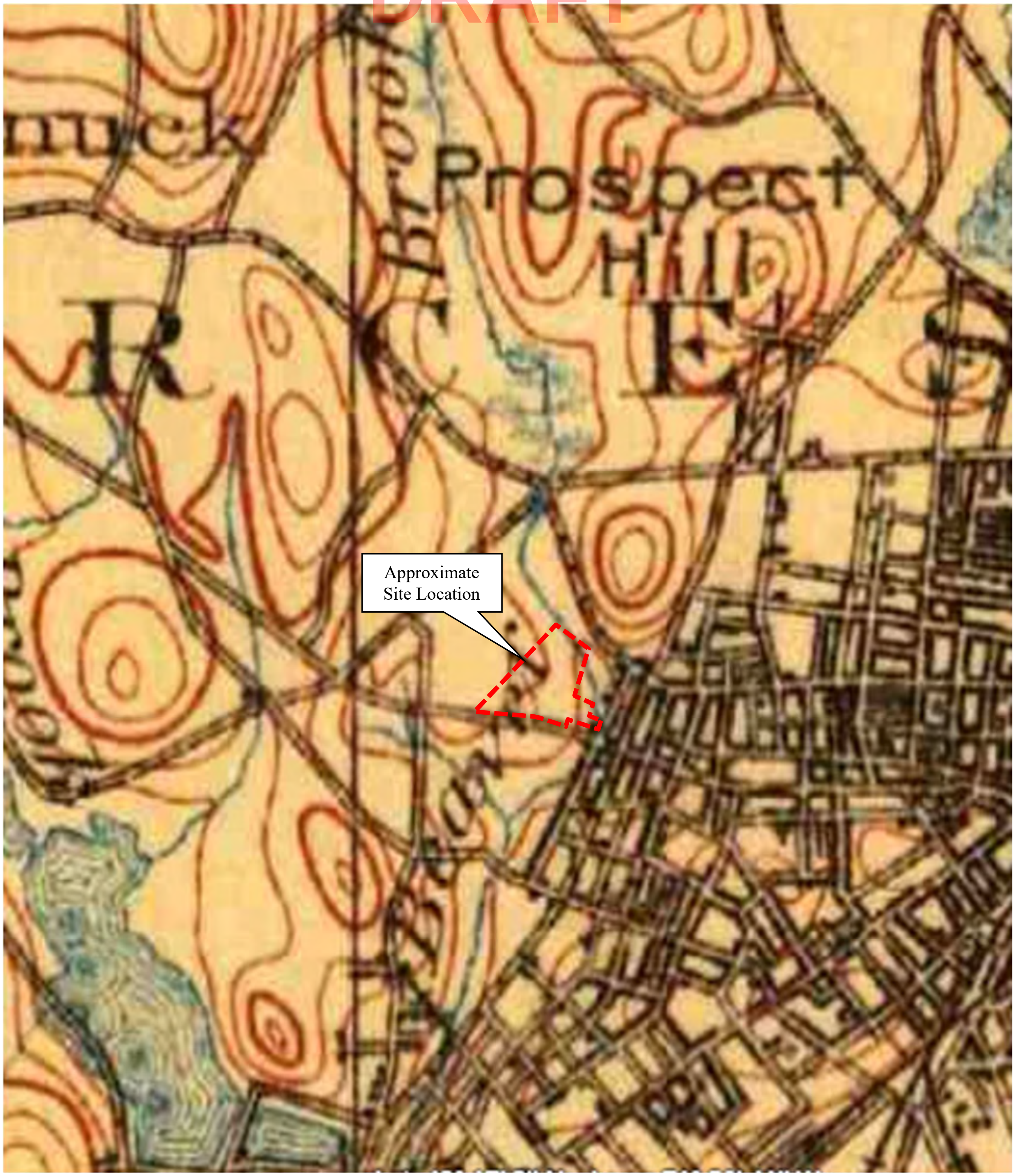
Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from https://ngmdb.usgs.gov/topoview/

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure A1 – 1886 Historical Topo Map (Foley Site)

LGCI
Lahlaf Geotechnical Consulting, Inc

Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from https://ngmdb.usgs.gov/topoview/

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure A2 – 1908 Historical Topo Map (Foley Site)

LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019

Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from https://ngmdb.usgs.gov/topoview/

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure A3 – 1934 Historical Topo Map (Foley Site)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019

Attachment B – Photographs

Photo No. 1: Existing field covered with snow facing north

Photo No. 2: Existing field facing northeast

Photo No. 3: Existing field facing northwest

Photo No. 4: Panoramic View of the existing field

Photo No. 5: Plowed concrete walkway with no evidence of gross settlement

Photo No. 6: Existing crack near the entrance of the stadium

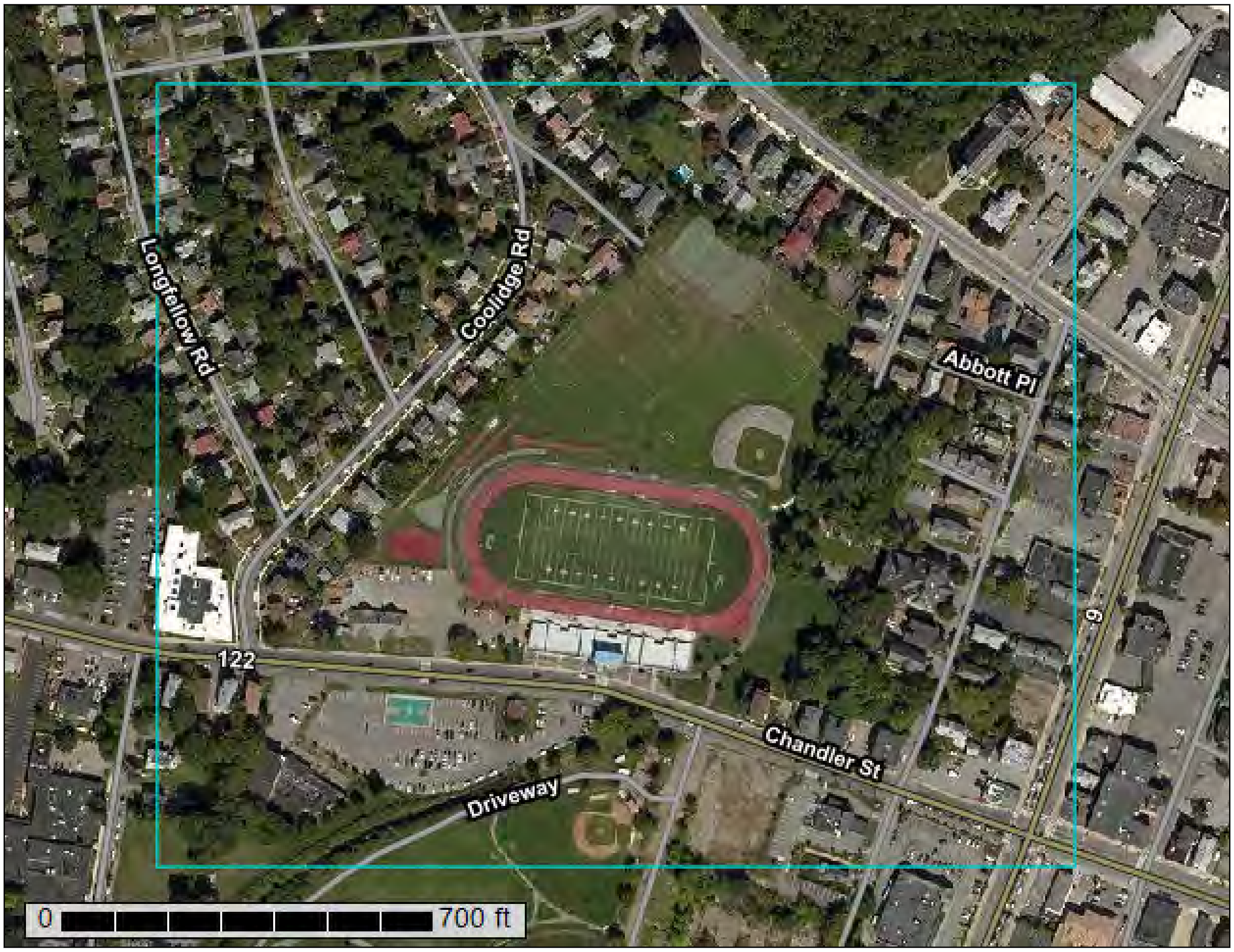
Attachment C – Excerpts of Soil Survey Report

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for
Worcester County, Massachusetts, Northeastern Part



November 15, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:3,810 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- ☐ Soil Map Unit Polygons
- Soil Map Unit Lines
- ■ Soil Map Unit Points

Special Point Features
- Blowout
- ⊠ Borrow Pit
- Clay Spot
- ◇ Closed Depression
- Gravel Pit
- ∴ Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- ◉ Miscellaneous Water
- ◎ Perennial Water
- ∨ Rock Outcrop
- + Saline Spot
- ⁙ Sandy Spot
- Severely Eroded Spot
- ◇ Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- △ Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 14, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
305D	Paxton fine sandy loam, 15 to 25 percent slopes	0.3	0.5%
602	Urban land	45.5	77.1%
651	Udorthents, smoothed	13.2	22.4%
Totals for Area of Interest		**59.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Worcester County, Massachusetts, Northeastern Part

305D—Paxton fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2w67j
Elevation: 0 to 1,450 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 6 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent
Landform: Drumlins, drainageways, ground moraines, depressions, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

602—Urban land

Map Unit Setting

National map unit symbol: w3q8
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land

651—Udorthents, smoothed

Map Unit Setting

National map unit symbol: w3q6
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 80 percent
Urban land: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Parent material: Made land over firm loamy basal till

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Urban Land

Properties and qualities

Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

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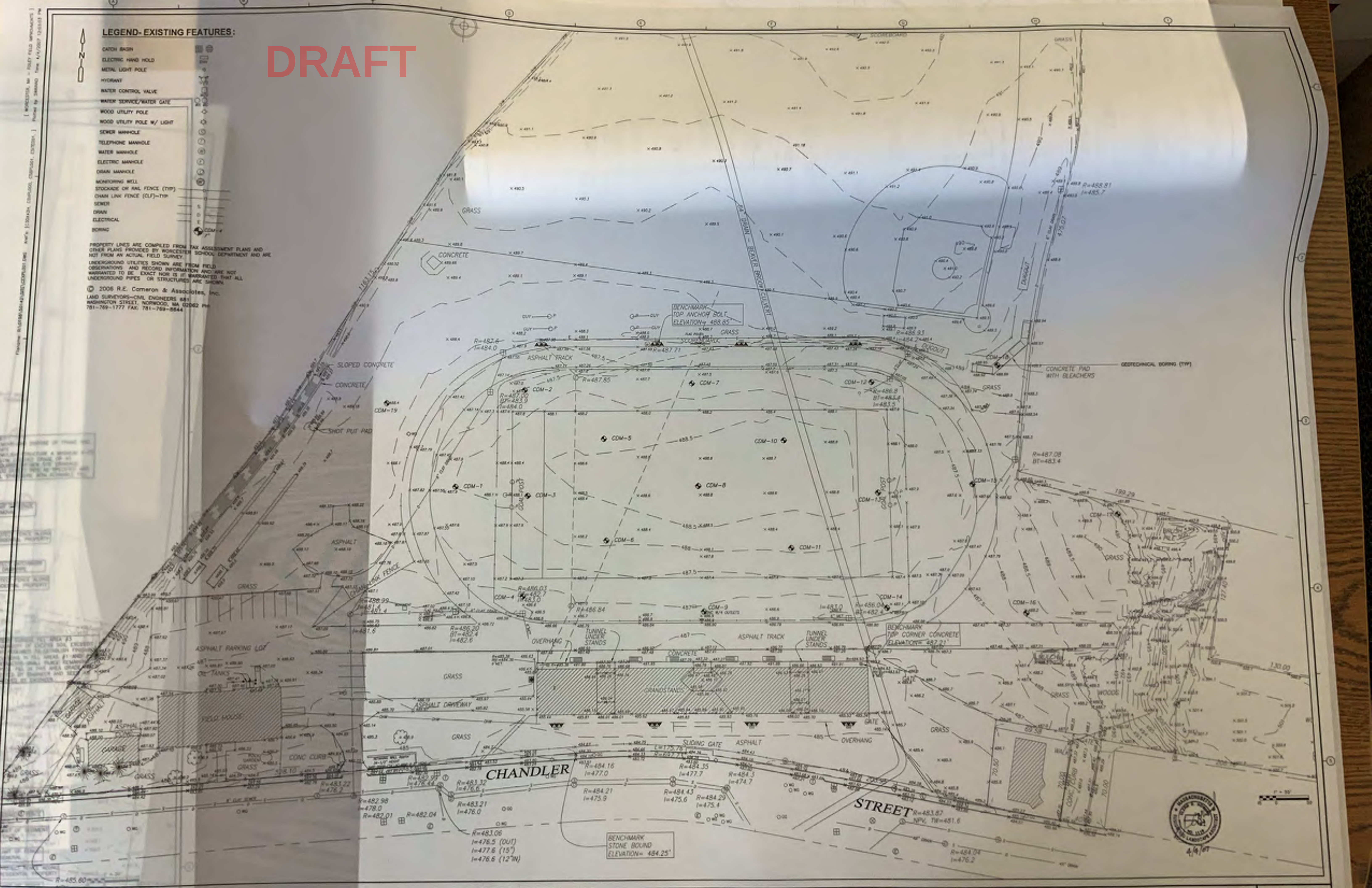
Attachment D – Locations and Logs of Previous Borings and Probes



PROPERTY LINES ARE COMPILED FROM TAX ASSESSMENT PLANS AND OTHER PLANS PROVIDED BY WORCESTER SCHOOL DEPARTMENT AND ARE NOT FROM AN ACTUAL FIELD SURVEY.

UNDERGROUND UTILITIES SHOWN ARE FROM FIELD OBSERVATIONS AND RECORD INFORMATION AND ARE NOT WARRANTED TO BE EXACT NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES OR STRUCTURES ARE SHOWN.

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CAMP DRESSER & McKEE
CDM

Sheet 1 of 1

Boring Number: CDM-1

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings and sand
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							░	Topsoil	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	60			▩	Fill	2" angular GRAVEL 10": Dry, brown, fine SAND and SILT, some gravel 36": Moist, light brown, fine to coarse SAND, some gravel, trace silt	
482.0 5										
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-1**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-2

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	**Sample Type**	**Sample Number**	**Sample Length (in)**	**Sample Recovery (in)**	**Blows per 6 inches**	**In-Situ Testing (tsf)**	**Graphic Log**	**Strata**	**Material Description**	**Remarks**
487.0 0							▨	*Fill*	24" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	42			▨		10": Dry, black, coal ASH 6": BRICK 10": Dry, black to gray, GRAVEL and coal ASH 6": BRICK	
482.0 5		S-2	60	60			▨			
							▥	*Silt*	Moist, brown to blue-gray, clayey SILT, little gravel	
477.0 10		S-3	60	60			░	*Sand*	Wet, brown, fine to coarse SAND and GRAVEL, trace silt	
472.0 15									BOE at 15 feet.	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotary	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-2

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-3

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							░	Topsoil	18" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	60			▩	FILL	Dry, light brown, fine to coarse SAND and GRAVEL, trace silt	
482.0 5									BOE at 5.5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-3**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-4

Client: City of Worcester
Project Name: Foley Field
Project Location: Worcester, Massachusetts
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	8" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	38			▨	Fill	6": Dry, black, coal ASH Bottom 24": Moist, brown, SILT, little gravel, little fine to coarse sand, little coal ash.	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-4

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-5

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							⁘	*Topsoil*	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	46			▩	*Fill*	Moist, dark brown, clayey SILT, little coal ash, little gravel, trace fine to coarse sand, trace brick	
482.0 5									BOE @ 5.5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-5

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-6

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 10

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							░	Topsoil	15" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	52			▩		Dry, black to brown, coal ASH, some fine sand, little silt, little gravel	
482.0 5							▩	Fill	Dry, black to brown, coal ASH, some fine sand, little silt, little gravel	
		S-2	60	60			▩			
							▥	Silt	Moist, blue-gray, clayey SILT, little gravel, 3" layer of brown, fine to coarse SAND, trace silt, trace gravel	
477.0 10									BOE at 10 feet	
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotary	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-6**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-7

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							▒	Topsoil	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	24			▩	Fill	2" gray, angular GRAVEL 10": Moist, gray to black, coal ASH, some fine to coarse sand, little gravel, trace brick	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-7**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-8

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	**Sample Type**	**Sample Number**	**Sample Length (in)**	**Sample Recovery (in)**	**Blows per 6 inches**	**In-Situ Testing (tsf)**	**Graphic Log**	**Strata**	**Material Description**	**Remarks**
487.0 0								*Topsoil*	6" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	45				*Fill*	Top 24": Moist, brown, clayey SILT, little fine to coarse sand, trace gravel Bottom 15": Moist, black to gray, coal ASH, trace brick	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-8**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-9

Client: City of Worcester
Project Name: Foley Field
Project Location: Worcester, Massachusetts
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							░	*Topsoil*	14" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	32			▨	*Fill*	Moist, gray, SILT, some fine sand, little coal ash, trace gravel (iron stained)	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-9**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-10

Client: City of Worcester

Project Location: Worcester, Massachusetts

Project Name: Foley Field

Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul

Pre-Drill Method:

Drilling Method/Casing: Geoprobe / 5' Macro Sleeve

Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.

Surface Elevation (ft.): 487

Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings

Logged By: Laurel Gionet

Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							░	*Topsoil*	18" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	60			▩	*Fill*	24": Moist, blue-gray, silty CLAY, trace fine sand, trace ash 18": Moist, black, coal ASH, little gravel, little fine to coarse sand, trace silt, trace brick, trace glass	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-10

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-11

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 10

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	**Sample Type**	**Sample Number**	**Sample Length (in)**	**Sample Recovery (in)**	**Blows per 6 inches**	**In-Situ Testing (tsf)**	**Graphic Log**	**Strata**	**Material Description**	**Remarks**
487.0 0								Topsoil	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	50				Fill	12" Moist, blue-gray, silty CLAY, trace gravel, trace roots 12" Moist, brown, fine SAND and SILT, little gravel, trace ash 14": Moist, brown to black, coal ASH, little fine to coarse sand	
482.0 5		S-2	60	24					Moist, brown to black, coal ASH, some silt, little gravel, 3" layer of brown coarse sand	
477.0 10		S-3	60	60					Top 6": Moist, brown to black, ASH, some silt, little gravel	
								Sand	Wet, light gray, fine to coarse SAND, trace silt	
								Silt	Wet, light gray, SILT, trace fine sand.	
472.0 15									BOE at 15 feet.	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-11**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-12

Client: City of Worcester

Project Location: Worcester, Massachusetts

Project Name: Foley Field

Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul

Pre-Drill Method:

Drilling Method/Casing: Geoprobe / 5' Macro Sleeve

Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.

Surface Elevation (ft.): 487

Total Depth (ft.): 5

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings

Logged By: Laurel Gionet

Drilling Date: Start: 1/30/2006 End: 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								*Topsoil*	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	36				*Fill*	Coal ASH	
482.0 5									BOE at 5 feet.	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-13

Client: City of Worcester

Project Location: Worcester, Massachusetts

Project Name: Foley Field

Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul

Pre-Drill Method:

Drilling Method/Casing: Geoprobe / 5' Macro Sleeve

Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.

Surface Elevation (ft.): 487

Total Depth (ft.): 10

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings

Logged By: Laurel Gionet

Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								*Topsoil*	8" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
							▨		6" Moist, blue gray, clayey SILT, trace ash, trace gravel	
		S-1	60	30			▨		Moist, brown to black, coal ASH, little gravel, little sand	
482.0 5							▨	*Fill*	Moist, black to dark gray, coal ASH, little silt, trace brick, trace glass	
		S-2	60	15			▨			
477.0 10									BOE at 10 feet	
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-13

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-14

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							⁙	*Topsoil*	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	40			▨	*Fill*	Moist, black to gray, coal ASH, little silt, little gravel	
482.0 5									BOE at 5 feet.	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-14

CAMP DRESSER & McKEE
CDM

Sheet 1 of 1

Boring Number: CDM-15

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	**Date**
11	1-30

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	8" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	60				Fill	Moist, brown, SILT, some gravel, trace fine to coarse sand.	
482.0 5		S-2	60	8					Dry, black to gray, coal ASH	
477.0 10									Wet, brown, coal ASH and fine to coarse SAND	
		S-3	60	34				Sand	Wet, gray, fine to coarse SAND, little gravel, trace silt	
472.0 15									BOE at 15 feet	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-15**

MASTER A GEOPROBE LOGS.GPJ - 2/2/06

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-16

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 Inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	10" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	31				Fill	Moist, black, SILT and SAND, some ash, trace gravel	
482.0 5									BOE at 5 feet.	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotary	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-16

CAMP DRESSER & McKEE
CDM

Sheet 1 of 1

Boring Number: CDM-17

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	**Date**
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0		S-1	60	36			▨	Fill	6" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots Dry, black to gray, coal ASH, little silt, trace brick, trace gravel, trace sand	
482.0 5									BOE at 5 feet.	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:
Date:
Boring Number: CDM-17

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-18

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	**Date**
10	1-31

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	6" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	60			▨	Fill	Moist, brown, clayey SILT, some gravel, little sand	
482.0 5		S-2	60	24			▨		Dry, black and gray, coal ASH, trace brick	
477.0 10		S-3	60	45				Organic Silt	Wet, brown and black, organic SILT and PEAT	
								Gravel	Wet, gray, GRAVEL and fine to coarse SAND, little silt	
472.0 15									BOE at 15 feet.	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotary	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-18**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-19

Client: City of Worcester

Project Location: Worcester, Massachusetts

Project Name: Foley Field

Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul

Pre-Drill Method:

Drilling Method/Casing: Geoprobe / 5' Macro Sleeve

Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.

Surface Elevation (ft.): 487

Total Depth (ft.): 15

Ground Water:

Depth (ft)	Date
11	1-31

Abandonment Method: Backfill with cuttings

Logged By: Laurel Gionet

Drilling Date: Start: 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0		S-1	60	30				*Topsoil* *Fill*	10" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots 15": Moist, brown, SILT, some gravel, little fine sand 5": coal ASH	
482.0 5		S-2	60	15					Moist, black to gray, coal ASH	
477.0 10		S-3	60	60				*Organic Silt*	Moist, black to gray, coal ASH Wet, black, organic SILT	
472.0 15								*Gravel*	Wet, brown, GRAVEL and fine to coarse SAND, trace silt BOE at 15 feet	
467.0										

Sample Types	
AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method			
HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-19

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-20

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	**Date**
11	1-31

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								*Topsoil*	18" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	38				*Fill*	Moist, brown, clayey SILT, with frequent layers of coal ash and brick	
482.0 5		S-2	60	34					Moist, black and gray, coal ASH	
477.0 10		S-3	60	60					Moist, black and gray, coal ASH	
								Organic Silt	Wet, black, organic SILT	
								Gravel	Wet, brown, GRAVEL and fine to coarse SAND, little silt	
472.0 15									BOE at 15 feet.	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Roterty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		**Fine Grained (Clay):**	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: **CDM-20**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-21

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	**Date**
10	1-31

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							∴	Topsoil	13" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
							▨	Fill	Dry, brown, SILT, little gravel, little fine sand	
		S-1	60	42			▨			
							▨		Dry, black, coal ASH	
482.0 5							▨		Dry, black to gray, coal ASH, trace brick	
		S-2	60	36			▨			
477.0 10							●	Gravel	Wet, brown orange, GRAVEL, little fine to coarse sand, trace silt	
							≡	Organic Silt	Wet, dark gray to black, organic SILT	
		S-3	60	60			≡			
							∴	Sand	Wet, gray, fine to coarse SAND and GRAVEL, trace silt	
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotary	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-21

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-20

Client: City of Worcester

Project Location: Worcester, Massachusetts

Project Name: Foley Field

Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul

Pre-Drill Method:

Drilling Method/Casing: Geoprobe / 5' Macro Sleeve

Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.

Surface Elevation (ft.): 487

Total Depth (ft.): 15

Ground Water:

Depth (ft)	**Date**
11	1-31

Abandonment Method: Backfill with cuttings

Logged By: Laurel Gionet

Drilling Date: Start: 1/31/2006 End: 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	18" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	38				Fill	Moist, brown, clayey SILT, with frequent layers of coal ash and brick	
482.0 5									Moist, black and gray, coal ASH	
		S-2	60	34						
477.0 10									Moist, black and gray, coal ASH	
		S-3	80	60				Organic Silt	Wet, black, organic SILT	
								Gravel	Wet, brown, GRAVEL and fine to coarse SAND, little silt	
472.0 15									BOE at 15 feet.	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rolarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-20

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-21

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	Date
10	1-31

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	13" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	42				Fill	Dry, brown, SILT, little gravel, little fine sand Dry, black, coal ASH	
482.0 5									Dry, black to gray, coal ASH, trace brick	
		S-2	60	36						
477.0 10								Gravel	Wet, brown orange, GRAVEL, little fine to coarse sand, trace silt	
		S-3	60	60				Organic Silt	Wet, dark gray to black, organic SILT	
								Sand	Wet, gray, fine to coarse SAND and GRAVEL, trace silt	
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotary	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-21**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-22

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	Date
10.4	1-31

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								*Topsoil*	18" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	60				*Fill*	Moist, brown, clayey SILT, some gravel, trace ash, trace brick	
482.0 5		S-2	60	27					Moist, black, coal ASH, little brick, little silt, little sand	
477.0 10		S-3	60	60					Moist, black, coal ASH, little brick, little silt, little sand	
								Sand and Gravel	Wet, brown, fine to coarse SAND and GRAVEL, trace silt	
472.0 15									BOE at 15 feet.	
467.0										

Sample Types	
AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method			
HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-22

MASTER A GEOPROBE LOGS.GPJ - 2/2/06

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-23

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	**Date**
10.8	1-31

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	11" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
								Fill	Dry, black, coal ASH, trace brick	
		S-1	60	23						
482.0 5									Dry, black, coal ASH, trace brick	
		S-2	60	30						
477.0 10									Dry, black, coal ASH, trace brick	
								Sand	Wet, brown, fine to coarse SAND, little silt, little gravel	
		S-3	60	32						
472.0 15									BOE at 15 feet.	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-23

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-24

Client: City of Worcester
Project Name: Foley Field
Project Location: Worcester, Massachusetts
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 15

Ground Water:

Depth (ft)	**Date**
12.5	1-31

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							⁘	*Topsoil*	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	43			▨	*Fill*	Moist, gray to black, coal ASH, little sand, little gravel, trace brick	
482.0 5		S-2	60	15			▨		Moist, brown red to black, coal ASH, some fine to coarse sand, little gravel	
477.0 10		S-3	60	60			▨		Moist, brown red to black, coal ASH, some fine to coarse sand, little gravel	
							●	*Gravel*	Wet, brown, GRAVEL and fine to coarse SAND, trace silt	
472.0 15									BOE at 15 feet.	
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-24**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-25

Client: City of Worcester
Project Location: Worcester, Massachusetts
Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 10

Ground Water:

Depth (ft)	Date
NR	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: **Start:** 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	18" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	32				Fill	Dry, black to gray, coal ASH, little silt, little sand, trace brick	
482.0 5									Dry, black to gray, coal ASH, little silt, little sand, trace brick	
		S-2	60	38				Organic Silt	Wet, dark gray to black, organic SILT and PEAT	
								Silty Clay	Wet, gray and brown yellow, mottled, silty CLAY, trace sand, trace gravel	
477.0 10									BOE at 10.5 feet	
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-25

MASTER A GEOPROBE LOGS.GPJ - 2/2/06

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-26

Client: City of Worcester
Project Name: Foley Field
Project Location: Worcester, Massachusetts
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							⁘	*Topsoil*	14" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	40			▩	*Fill*	Dry, black to gray, coal ASH, some gravel, trace fine to coarse sand, trace brick	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-26**

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-27

Client: City of Worcester
Project Location: Worcester, Massachusetts

Project Name: Foley Field
Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul
Pre-Drill Method:
Drilling Method/Casing: Geoprobe / 5' Macro Sleeve
Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.
Surface Elevation (ft.): 487
Total Depth (ft.): 5

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings
Logged By: Laurel Gionet
Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0							▨	*Topsoil*	12" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	30			▨	*Fill*	Dry, black to gray, coal ASH, trace brick	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-27

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-28

Client: City of Worcester

Project Location: Worcester, Massachusetts

Project Name: Foley Field

Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul

Pre-Drill Method:

Drilling Method/Casing: Geoprobe / 5' Macro Sleeve

Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.

Surface Elevation (ft.): 487

Total Depth (ft.): 5

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings

Logged By: Laurel Gionet

Drilling Date: Start: 1/30/2006 **End:** 1/30/2006

Elev, Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0		S-1	60	36			⁘ ▨	*Topsoil* *Fill*	8" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots Dry, brown, fine to coarse SAND, some gravel, some silt 2" layer of asphalt pavement	
482.0 5									BOE at 5 feet	
477.0 10										
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotary	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):		Fine Grained (Clay):	
Very Loose:	0-4	Very Soft:	2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-28

CAMP DRESSER & McKEE

CDM

Sheet 1 of 1

Boring Number: CDM-29

Client: City of Worcester

Project Location: Worcester, Massachusetts

Project Name: Foley Field

Project Number:

Drilling Contractor/Driller: New Hampshire Boring, Inc / Paul

Pre-Drill Method:

Drilling Method/Casing: Geoprobe / 5' Macro Sleeve

Hammer Weight/Drop Height/ Spoon Size: lb / in / in O.D.

Surface Elevation (ft.): 487

Total Depth (ft.): 10

Ground Water:

Depth (ft)	Date
NE	

Abandonment Method: Backfill with cuttings

Logged By: Laurel Gionet

Drilling Date: Start: 1/31/2006 **End:** 1/31/2006

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Sample Recovery (in)	Blows per 6 inches	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
487.0 0								Topsoil	8" Topsoil: Frozen to moist, dark brown, SILT, little fine sand, trace gravel, trace roots	
		S-1	60	40				Sand and Gravel	Dry, light brown, fine to coarse SAND and GRAVEL, trace silt	
482.0 5		S-2	60	60					Moist to wet, brown, fine to coarse SAND and GRAVEL, trace silt	
477.0 10									BOE at 10 feet	
472.0 15										
467.0										

Sample Types

AS	Auger/Grab Sample
CS	California Sampler
BX	1.5" Rock Core
NX	2.1" Rock Core
GP	Geoprobe
HP	Hydro Punch
SS	Split Spoon
ST	Shelby Tube
WS	Wash Sample

Drilling Method

HSA	Hollow Stem Augers	RC	Reverse Circulation
SSA	Solid Stem Augers	CT	Cable Tool
HA	Hand Augers	JET	Jetting
AR	Air Rotarty	D	Driving
DTR	Dual Tube	DTC	Drill Through Casing
FR	Foam Rotary		
MR	Mud Rotary		

Consistency vs Blowcount/Foot

Granular (Sand):

Very Loose:	0-4
Loose:	4-10
Medium Dense:	10-30
Dense:	30-50
Very Dense:	>50

Fine Grained (Clay):

Very Soft:	2
Soft:	2-4
Medium Stiff:	4-8
Stiff:	8-15
Very Stiff:	15-30
Hard:	>30

Modified Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

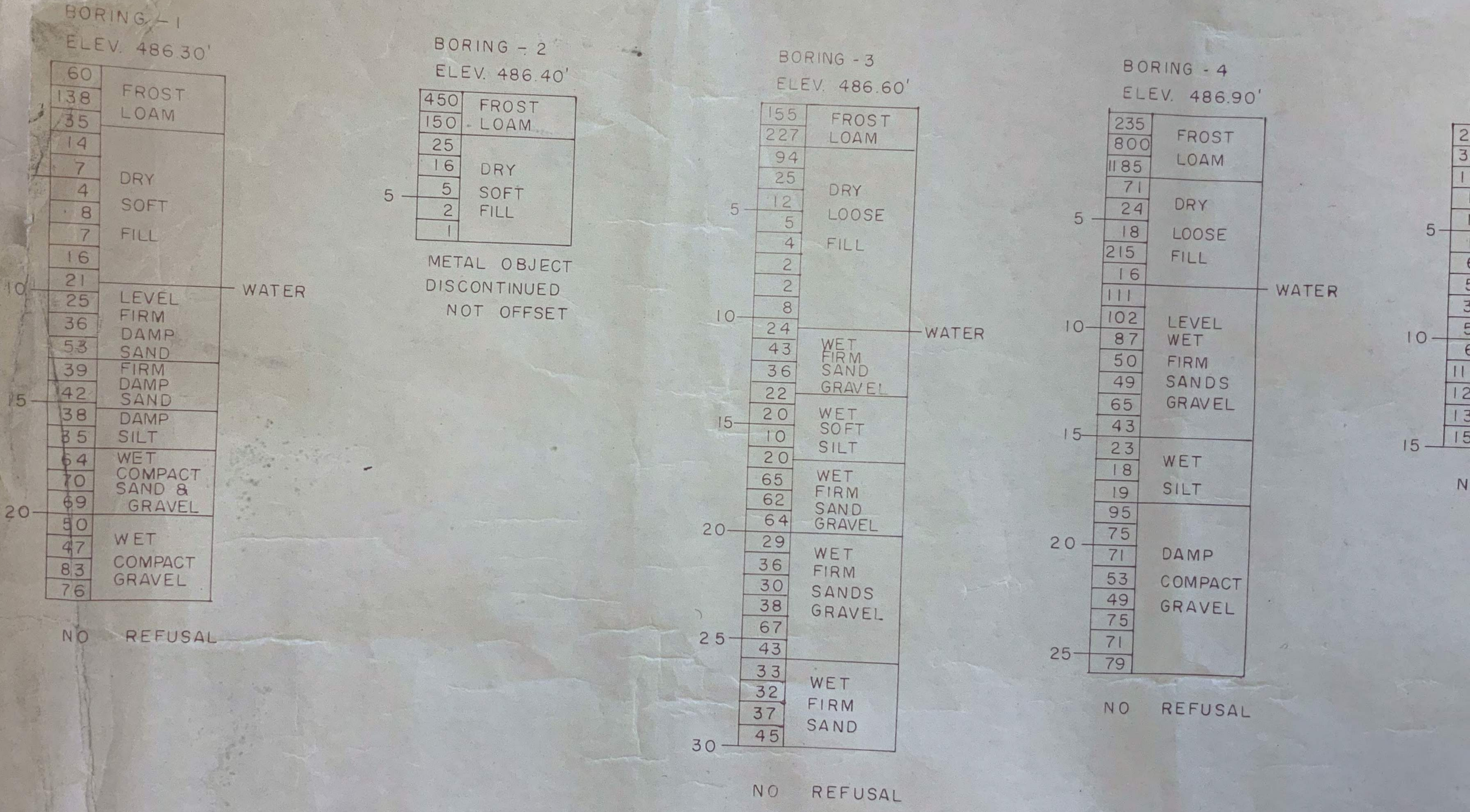
moisture, density, color

Reviewed by:

Date:

Boring Number: CDM-29

J. A. SINNOTT CO.
32 DAWSON RD.
WORCESTER, MASS.



BORING - 1
ELEV. 486.30'

	60	FROST LOAM	
	138		
	35		
	14	DRY SOFT FILL	
	7		
	4		
	8		
	7		
	16		
	21		
10	25	LEVEL FIRM DAMP SAND	WATER
	36		
	53		
	39	FIRM DAMP SAND	
15	42		
	38	DAMP SILT	
	35		
	64	WET COMPACT SAND & GRAVEL	
	70		
	69		
20	50	WET COMPACT GRAVEL	
	47		
	83		
	76		

NO REFUSAL

BORING - 2
ELEV. 486.40'

	450	FROST LOAM
	150	
	25	DRY SOFT FILL
	16	
5	5	
	2	
	1	

METAL OBJECT
DISCONTINUED
NOT OFFSET

BORING - 3
ELEV. 486.60'

	155	FROST LOAM	
	227		
	94	DRY LOOSE FILL	
	25		
	12		
5	5		
	4		
	2		
	2		
	8		
10	24	WET FIRM SAND GRAVEL	WATER
	43		
	36		
	22		
15	20	WET SOFT SILT	
	10		
	20		
	65	WET FIRM SAND GRAVEL	
	62		
	64		
20	29	WET FIRM SANDS GRAVEL	
	36		
	30		
	38		
	67		
25	43		
	33	WET FIRM SAND	
	32		
	37		
30	45		

NO REFUSAL

BORING - 4
ELEV. 486.90'

	235	FROST LOAM	
	800		
	1185		
	71	DRY LOOSE FILL	
5	24		
	18		
	215		
	16		
	111	LEVEL WET FIRM SANDS GRAVEL	WATER
10	102		
	87		
	50		
	49		
	65		
	43		
15	23	WET SILT	
	18		
	19		
	95	DAMP COMPACT GRAVEL	
20	75		
	71		
	53		
	49		
	75		
	71		
25	79		

NO REFUSAL

TEST BORING DATA

NOTT CO.
SON RD.
STER, MASS.

FEB. 2, 1963 TO
FEB. 26, 1963

STANDARD PENETRATION TEST
WEIGHT OF HAMMER 140 LB.
HAMMER FALL 30"
SAMPLER O.D. 2"

BORING - 5
ELEV. 487.00'

	210	FROST LOAM	
	325		
	170		
	14	DRY FIRM SAND	
	17		
5	19		
	62	DRY COMPACT GRAVEL	
	55		
	38		
	51		WATER
10	69		
	114	WET V. COMP. GRAVEL	
	124		
	135		
15	155		

NO REFUSAL

BORING - 6
ELEV. 487.00'

	235	FROST FILL OR TOPSOIL	
	165		
	187		
	107		
5	187	DRY COMPACT GRAVEL	
	75		
	67		
	56		
	61		
10	89		WATER
	97	DAMP V. COMP.	
	75		
	114		
	129		
15	147		
	132		

NO REFUSAL

BORING - 7
ELEV. 487.20'

	172	FROST V. COM.	
	215		
	155		
	32	DRY FIRM SAND GRAVEL	
5	33		
	25		
	62		
	330		
	87		WATER
10	54	WET FIRM SANDS GRAVEL	
	45		
	37		
	24		
	27		
15	61		
	35		
	26		
	30		
	45		
20	50		
	90		
	30		
	76		
	129		

NO REFUSAL

BORING - 8
ELEV. 486.10'

	176	FROST LOAM	
	212		
	25		
	7	DRY LOOSE FILL	
5	6		
	6		
	10		
	25		
	40	DAMP FIRM SAND GRAVEL	
10	56		
	54		
	49		WATER
	41	WET LOOSE GRAVEL	
	36		
15	29		
	43		
	33		
	28		

NO REFUSAL

BORING - 9
ELEV. 486.20'

	219	FROST LOAM	
	135		
	38	DRY COMPACT SAND GRAVEL	
	59		
5	69		
	90		
	70		
	144		
	41		WATER
10	22	WET LOOSE GRAVEL	
	17		
	16		
	25	WET FIRM GRAVEL	
	24		
15	25		
	28		
	31		
	35		
	35		
20	68		

NO REFUSAL


COMPACT SAND & GRAVEL
WET COMPACT GRAVEL
NO REFUSAL
WET FIRM SAND GRAVEL
WET FIRM SANDS GRAVEL
WET FIRM SAND
NO REFUSAL
SILT
DAMP COMPACT GRAVEL
NO REFUSAL
NO REFUSAL
NO REFUSAL
SANDS GRAVEL
NO REFUSAL
GRAVEL
NO REFUSAL
FIRM GRAVEL
NO REFUSAL
NO REFUSAL
BORING - 14
ELEV 485.80'
F
F
FROST LOAM
12
20
12
9
13
15
16
27
DRY LOOSE FILL GRAVEL
WATER
38
29
26
41
35
35
WET FIRM COARSE GRAVEL
68
65
74
59
54
63
DAMP COMPACT GRAVEL SAND
5
10
15
20
NO REFUSAL
0+50
0+00
A
B
C
D
E
F
G
H
I
J
K
L
60'x 12"x 3'0" DEEP CONCRETE BASE EXTEND 18" ABOVE GRADE.
EXISTING WATER PIPES TO BE REMOVED UNDER OPERATIONS.
BEAVER BROOK
WIRE FENCE & GATES.
CONCRETE PAVING
487'-0"
487'-0"
486'-6"
486'-0"
485'-6"
485'-0"
484'-6"
484'-0"
486'-6"
486'-0"
485'-6"
485'-0"
484'-6"
484'-0"
485'-6"
485'-0"
GRAVEL DRIVE
GRAVEL DRIVE
6'x6'x6' CONC. PAD
CONCRETE APRON
LIMIT OF CONTRACT
LIMIT OF CONTRACT
LIMIT OF CONTRACT
ROUGH, FINISH GRADING & SEEDING TO BE DONE BY OWNER
ROUGH, FINISH GRADING & SEEDING TO BE DONE BY OWNER.
FIN. FL. 486'-0"
RAMP UP
RAMP UP
RAMP UP
CONCRETE PAVING
CONCRETE PAVING
CONCRETE PAVING
2 - 4" CONDUITS
FENCE N.I.C.
FENCE N.I.C.
TREE STUMP TO BE REMOVED
4" WATER SERVICE
2" GAS SERVICE
6" SAN. SEWER TRANS.
5" C.I.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
N.E.T. COND
N.E.T. COND
8" SAN
15" SURF
WATER
8" SAN
15" SURF
WATER
WATER
WATER
WATER
GAS
GAS
EL COND
8" SAN
CHANDLER STREET
BITUMINOUS PAVING WITH PAINTED LINES
0+50
1+00
0+50
2

LGCI
Lahlaf Geotechnical Consulting, Inc.

December 12, 2019

Mr. Robert Para Jr., AIA
Lamoureux Pagano & Associates, Inc.
108 Grove Street, Suite 300
Worcester, MA 01605
Tel: (508) 752-2831
Fax: (508) 757-7769
E-mail: RPara@lpaa.com

Re: Preliminary Geotechnical Review Services
Proposed Doherty High School
Chandler Magnet School Site
Worcester, Massachusetts
LGCI Project No. 1922

Dear Mr. Para:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has performed a site visit and completed a preliminary review of the geotechnical data available for the Chandler Magnet School site (Chandler Site) in relation to the proposed Doherty High School in Worcester, Massachusetts. Our services were performed in accordance with our proposal No. 19087 dated October 14, 2019. Ms. Kathryn Crockett of Lamoureux Pagano & Associates, Inc. (LPA) authorized our services by signing our proposal on November 13, 2019.

This letter includes a summary of our field observations, a summary of the subsurface data we reviewed, our opinion about possible foundation issues during construction, and our recommendations for subsurface explorations.

1. Reviewed Documents

LGCI reviewed the following documents:

- "Custom Soil Resource Report for Worcester County, Massachusetts, Northeastern Part," (Soil Survey Report) National Cooperative Soil Survey/National Resources Conservation Services, USDA (Map and soil description printed November 15, 2019 from https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx).

- "Surficial Materials Map of the North Worcester, Massachusetts," prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 126 – North Worcester.

- "Plot Plan showing Location of Buildings, Chandler Street Junior High School," (Plot Plan), prepared by Architects Collaborative, Cambridge, MA, dated July 16, 1951, and provided to us via e-mail by LPA on August 23, 2019.

- “Aerial View,” provided to us by LPA via e-mail on September 5, 2019.

- Drawing C-1 titled: “Concept Plan, Chandler Magnet School,” (Concept Plan), prepared by Nitsch Engineering, Inc., dated October 15, 2019, provided to us by LPA via e-mail on October 31, 2019.

- Sketch showing concept plan titled: “3.3.3 - Final Evaluation of Alternatives, Preliminary Design Options, Option C.2 - New Construction on Chandler Magnet Site (Proposed Scheme), provided to us by LPA via e-mail on December 6, 2019.

- Sketches showing preliminary grading (Preliminary Grading Plans) provided to us by LPA via e-mail December 6, 2019.

2. Site Location Description

We understand that one of the sites being considered for the proposed Doherty High School is the Chandler Site located at 525 Chandler Street in Worcester, Massachusetts as shown in Figure 1. The site has an irregular shape and is bordered by Chandler Street on the southern side, by May Street and private properties on the eastern side, and by wooded land and private properties on the northern and western sides. The site is an active elementary school. The site is occupied by the existing one- to two- story school building, athletic fields, and paved driveways and parking lots. We understand that the existing school was constructed in the early 1950’s. The existing building is located on the southern side of the site. A paved driveway looping off of Chandler Street is located on the southern side of the existing building. Two paved parking lots are located on the eastern and northern sides (one on each side) of the existing building. Athletic fields are located on the northern side of the site, north of the existing building. The area west of the athletic fields is wooded.

Based on the Aerial View and the Plot Plan, utilities at the site include a 36-inch and 42-inch drain lines, and an 8-inch and a 10-inch sewer lines. Based on the Concept Plan, the existing grades at the site range between about El. 568 feet near Chandler Street and about El. 690 feet on the northwestern side of the site. The site sits flat at about El. 572 feet around the existing building. The grades slope upward from the northern side of the parking lot just north of the existing building toward the existing athletic fields to between El. 590 feet and El. 592 feet. The site steeply slopes up from about El. 590 feet to about El. 690 feet within the wooded area west of the existing athletic fields. Based on historical topographic maps, included in Attachment A, a cut into the existing slope on the western side of the existing athletic fields The historical topographic maps also show that a stream crossed the site. The stream was filled between 1948 and 1960, possibly when the existing school was constructed. It appears that the material cut from the hill was used to fill the stream to create the area currently used as athletic fields.

3. Project Description

We understand that the City of Worcester is considering the Chandler Site as one of three possible sites for the proposed Doherty High School. We understand that if the Chandler Site is selected, the proposed construction would consist of a high school building mostly on the southern side of the site. The proposed building footprint will overlap with the northern portion of the existing building and the existing parking lot north of the existing building. The western portion of the proposed building will extend beyond the property limits and will require land-taking on the western side of the lower portion of the site.

Based on the Preliminary Grading Plans, we estimate that the proposed building will have a footprint of about 165,000 square feet and will be four (4) stories high. Based on the Concept Plan, the existing grades range between about El. 572 feet on the southern side and about El. 576 feet on the northern side with a local high near the northwestern corner of the proposed building at about El. 600 feet. Based on the Proposed Scheme and the Preliminary Grading Plans, we understand that the proposed floors will be configured as follows:

- The first floor and second floors will extend over the entire footprint of the proposed building. The first floor will have a finished floor elevation (FFE) of El. 468 feet; thus, requiring cuts of between 2 feet on the southern side of the proposed building and up to 32 feet near the northwestern corner of the proposed building. The area east of the first floor will not be excavated. The second floor will have an FFE of El. 588 feet.
- The third floor of the proposed building will approximately extend over the eastern half of the proposed building footprint, while the other half will be open to the proposed gymnasium or cafeteria or will consist of a roof. The third floor will have an FFE of El. 603 feet.
- The fourth floor of the proposed building will approximately extend over the eastern third of the proposed building footprint while its western portion will be a roof. The fourth floor will have an FFE of El. 618 feet.

The proposed athletic fields will mostly remain in their current location, i.e., north of the proposed building but will extend further west from the current western limits into the existing hill.

Based on the Preliminary Grading Plans, the proposed exterior grade will range between about El. 575 feet near the southeastern corner of the proposed building and El. 590 feet near the northwestern corner of the proposed building; thus, requiring about 5 feet of fill near the southeastern corner of the proposed building and cuts of about 10 feet near the northwestern corner of the proposed building. The grades within the proposed athletic fields will range between about El. 590 feet and El. 595 feet; thus, requiring about 3 feet of fill within the majority of the proposed fields, expect on the western side where cuts of up to 10 feet will be required. We understand that site retaining walls will be requiring along the western edge of the proposed construction area.

Field Observations

An LGCI representative visited the site on December 5, 2019. The purpose of our visit was to observe site features such as wet areas and other features that may impact construction.

The site was mostly covered with about one foot of snow at the time of our visit and site features were concealed by the snow.

Photographs of the sites are included in Attachment B.

4. Summary of Existing Subsurface Data

Soil Survey Report – Based on the Soil Survey Report listed in Section 1, the soils at the site are classified primarily as Smoothed Udorthents. Udorthents are defined as "made land over firm loamy basal till." The Soil Survey Report does not include the thickness of the A and B horizons. However, it includes a depth to groundwater that is deeper than 80 inches.

A copy of the Soil Survey Report and Map are included in Attachment C.

Surficial Geologic Map – The Surficial Geologic Map (listed in Section 1) indicates that the natural soils in the general vicinity of the site consist of artificial fill, thin till, thick till, and coarse deposits. Based on the Surficial Geologic Map, the artificial till consist of earth and manmade materials that have been artificially placed. The Surficial Geologic Map indicates that the artificial fill is present on the eastern side of the existing athletic field. The thin and thick till consist of a non-stratified matrix of sand, some silt, and little clay containing scattered pebbles to boulders. Boulders are more commonly found within the thin till. The Surficial Geologic Map indicates that the thin till is present on the northern side of the existing building and on the western side of the existing athletic fields and is generally less than 10 to 15 feet thick. The Surficial Geologic Map indicates that the thick till is present in the hill west of the existing athletic fields and is generally greater than 10 to 15 feet thick. The coarse deposits consist of gravel deposits, sand and gravel deposits, and sand deposits. These deposits are present on the southwestern side of the site.

The Surficial Geologic Map of the site is shown in Figure 2.

Previous Explorations – Based on the Plot Plan, twelve (12) borings were advanced at the site at an unspecified date. The logs of five (5) of the borings advanced (Boring No. 1, Boring No. 3, Boring No. 7, Boring No. 8, and Boring No. 10) are shown in the Plot Plan. The locations and boring logs of Boring No. 2, Boring No. 4, Boring No. 5, Boring No. 6, Boring No. 9, Boring No. 10A, and Boring No. 11 are not shown in the Plot Plan. Boring No. 1, Boring No. 3, Boring No. 7, and Boring No. 8 were advanced at the location of the existing athletic fields and extended to depths ranging between 4.1 and 8.8 feet beneath the ground surface. Boring No. 10 was advanced in the play yard west of the existing building and extended to a depth of 7 feet beneath the ground surface.

The locations of the borings and the logs you provided to us are included in Attachment D.

Boring No. 1, Boring No. 3, Boring No. 7, and Boring No. 8 generally indicated compact fine sand with clay and gravel that extended to the termination depth of Boring No. 8 at 7 feet beneath the ground surface. In Boring No. 1, Boring No. 3, and Boring No. 7 the compact fine sand with clay and gravel extended to the top of a very compact sand with clay and gravel, at depths ranging between 2 and 3.7 feet beneath the ground surface. Underlying the compact fine sand with clay and gravel was a very compact fine sand with clay and gravel that extended to the termination depth of Boring No. 1, Boring No. 3, and Boring No. 7.

Boring No. 10 generally indicated loam that extended to a depth of 1.4 feet beneath the ground surface. Underlying the loam was a compact fine sand with clay and gravel that extended to the termination depth of Boring No. 10 at a depth of 7 feet beneath the ground surface.

A rock obstruction was encountered in Boring No. 1, Boring No. 7, Boring No. 8, and Boring No. 10 at depths of 8.8, 4.1, 7, and 7 feet beneath the ground surface respectively.

The Plot Plan and the logs of the previous borings suggest that the western side of the existing athletic fields was cut and that the eastern side was filled.

5. Preliminary Recommendations

Please note that the review of available information summarized in this letter is not a substitute for a subsurface exploration program. The information gathered as part of this review may be incomplete and the recommendations derived therefrom are at best preliminary in nature and must be confirmed with actual subsurface explorations, laboratory testing, and geotechnical analyses.

Based on our review of the documents listed in Section 1, our understanding of the proposed construction, and our review of the previous explorations at the site, there are a few issues that we would like to highlight for consideration and discussion.

- Based on the previous borings the natural soils at the site are dense (compact) sand and gravel (glacial till). The natural glacial till is suitable to support the proposed building with footings and slabs placed on Structural Fill placed directly on top of the glacial till.

- The Plot Plan and the historical topographic maps indicate the presence of fill within the northern portion of the proposed building. Existing fill that was not placed with strict moisture, density, and gradation control presents the risk of unpredictable settlements that may result in the poor performance of floor slabs and foundations. While the proposed grades may require removing most of the existing fill, the proposed excavations to reach the proposed FFE may not locally extend deeper than the bottom of the existing fill and the possible underlying loam and loose sand. These materials are not suitable to support the proposed building and should be entirely removed and replaced with Structural Fill.

- We believe that the fill formerly placed to raise the grades within the existing athletic fields was glacial till cut from the southern side of the site. The glacial till is generally silty and the existing fill is anticipated not to meet the gradation requirements for Ordinary Fill or Structural Fill.

6. Recommendations for Subsurface Explorations

To explore for the presence of fill within the proposed building footprint and to explore for the possible presence of shallow rock along the proposed site retaining walls, we recommend performing additional explorations at the site if this site is selected. The additional explorations should include at least twelve (12) soil borings, including at least six (6) borings to rock, and two (2) groundwater observation wells. The geotechnical explorations should also include at least eight (8) test pits to explore for rock in shallow till areas.

The geotechnical explorations should be coordinated with the work of an environmental engineer to pre-characterize the site soils that will be generated during the deep cuts and that will need to be disposed of offsite.

7. Limitations

Our letter is based on project information provided to us at the time of this letter. If changes to the type, size, and location of the proposed structure or to the site grading are made, the recommendations contained in this letter shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based solely on these preliminary recommendations.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminates in or around the site.

The recommendations in this letter are based in part on the data obtained from the review of existing subsurface data. The recommendations contained in this letter are at best preliminary in nature and must be confirmed with actual subsurface explorations, laboratory testing, and geotechnical analyses.

Our letter has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Lamoureux Pagano & Associates, Inc. for the specific application to the proposed Chandler Site at the Doherty High School in Worcester, Massachusetts as conceived at this time.

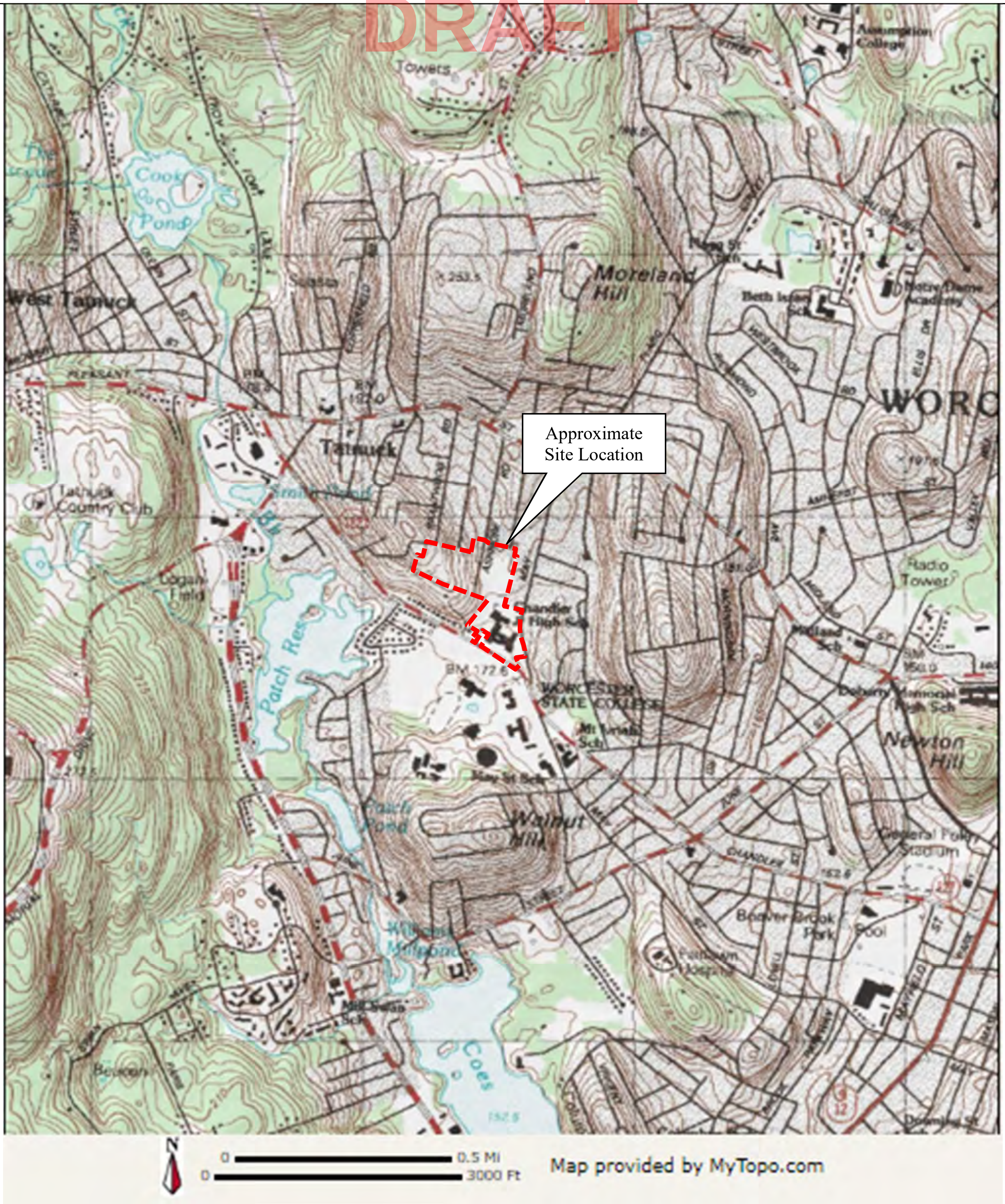
If you have any questions or need further assistance, please contact us at (978) 330-5912.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

Attachments: Figure 1 – Site Location Map
Figure 2 – Surficial Geologic Map
Attachment A – Historical Topo Maps
Attachment B – Photographs
Attachment C – Excerpts of Soil Survey Report
Attachment D – Locations and Logs of Previous Borings

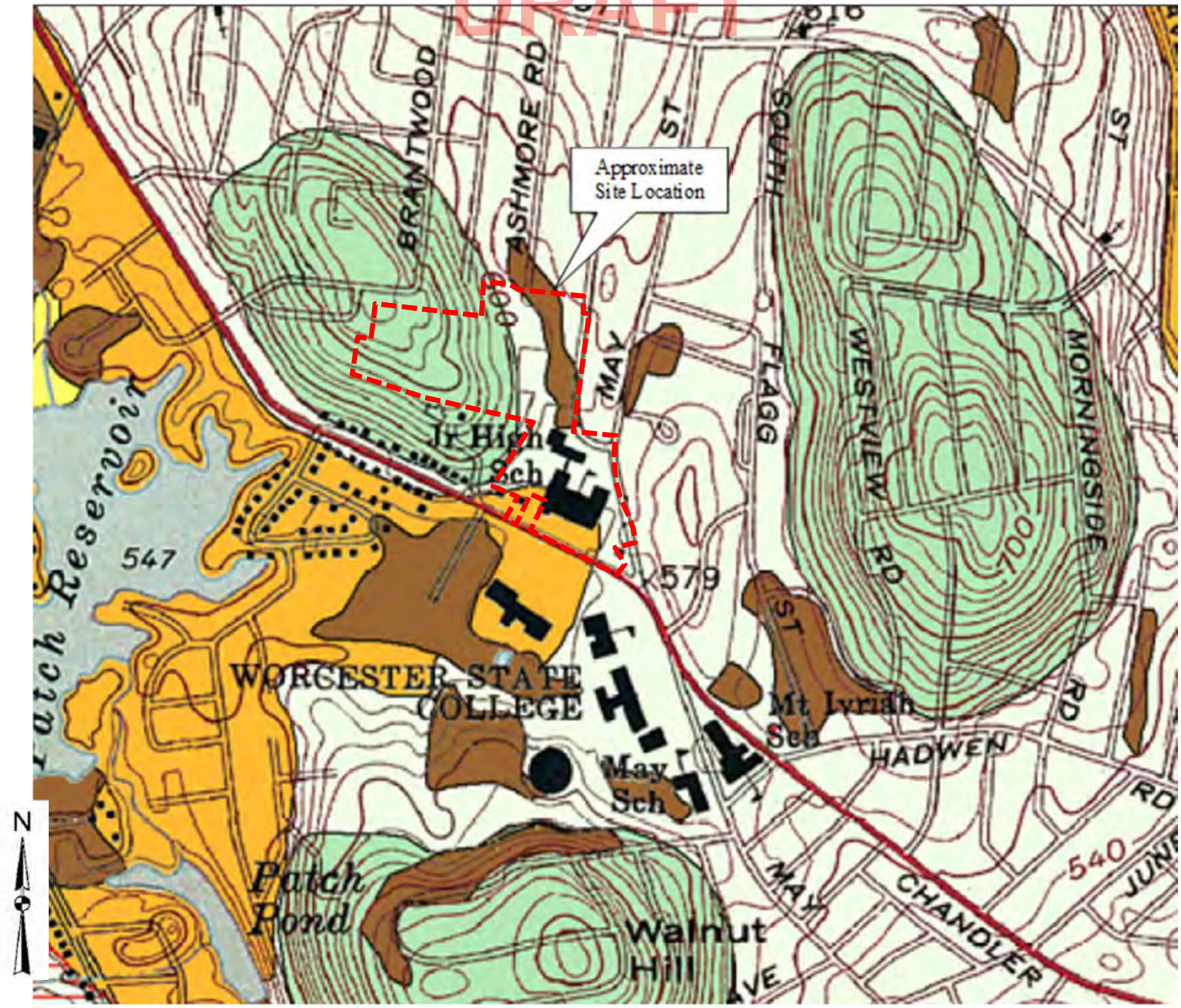


Map provided by MyTopo.com

Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure 1 – Site Location Map (Chandler Site)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019



🟫 **Artificial fill**—Earth materials and manmade materials that have been artificially emplaced, primarily in highwa and railroad embankments and in dams; unit may also include landfills, urban-development areas, and filled coastal wetlands

🟧 **Coarse deposits** consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

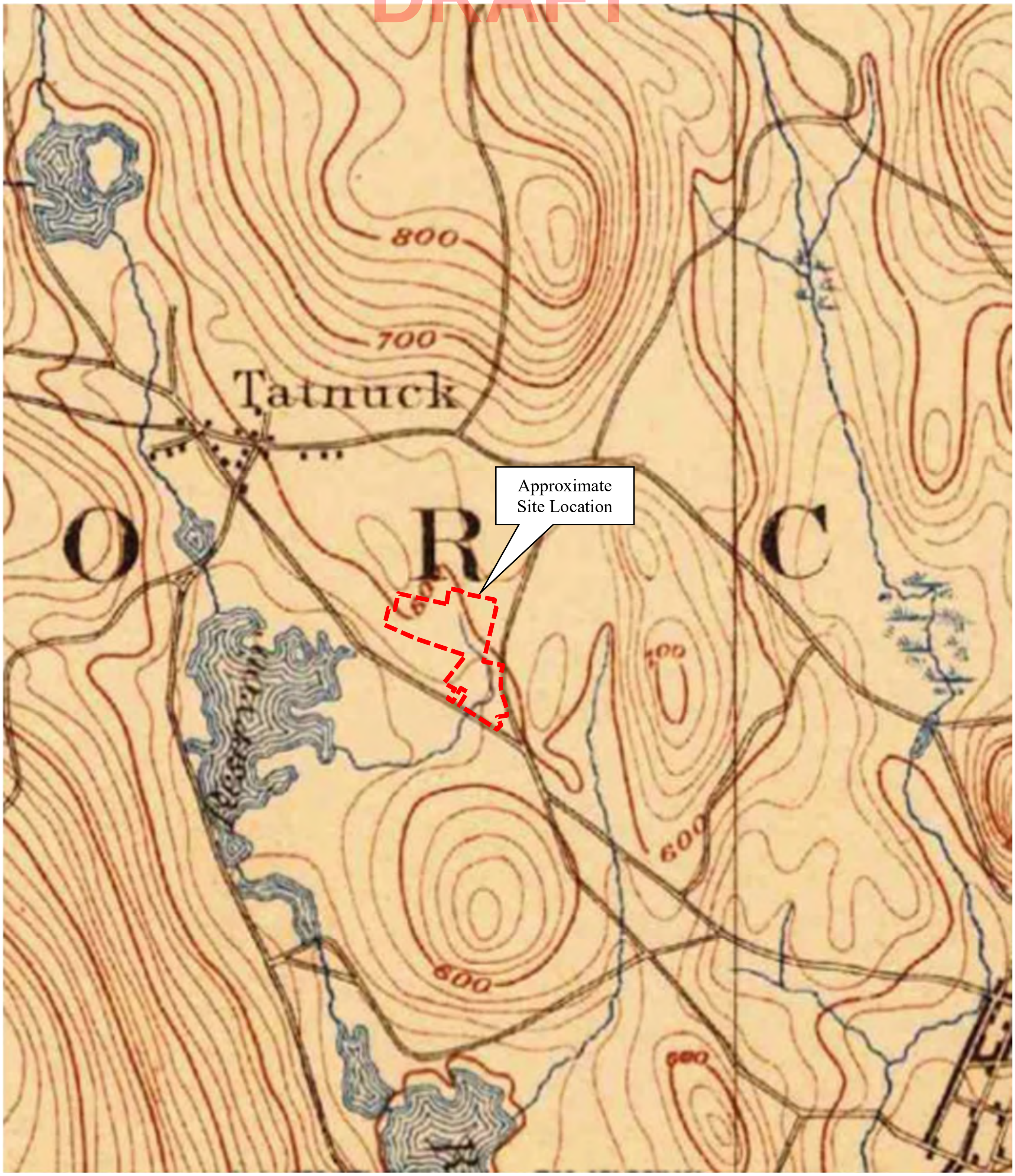
🟨 **Thin till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts; large surface boulders are common; unit was mapped where till is generally less than 10 to 15 ft thick including areas of shallow bedrock. Predominantly consists of upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser grained ablation facies, melted out from supraglacial position, and an underlying more compact, finer grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarse-grained crystalline rocks. Across Massachusetts, fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut Valley lowland, marble in the western river valleys, and fine-grained schists in upland areas

🟩 **Thick till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebbles, cobbles, and boulders in the shallow subsurface; at greater depths consists of compact, nonsorted matrix of silt, very fine sand, and some clay containing scattered small gravel clasts. Mapped in areas where till is greater than 10 to 15 ft thick, mostly in drumlin landforms in which till thickness commonly exceeds 100 ft (maximum recorded thickness is 230 ft). Although upper till of late Wisconsinan age is the surface deposit, lower till of probable Illinoian age constitutes the bulk of the material in thick-till areas. Lower till is moderately to very compact and is commonly finer grained and less stony than upper till. An oxidized zone, the lower part of a soil profile formed during a period of interglacial weathering, is generally present in the upper part of the lower till. This zone commonly shows closely spaced joints that are stained with iron and manganese oxides

Figure based on map titled: "Surficial Materials Map of the North Worcester, Massachusetts," prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 126 – North Worcester.

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure 2 – Surficial Geologic Map (Chandler Site)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019

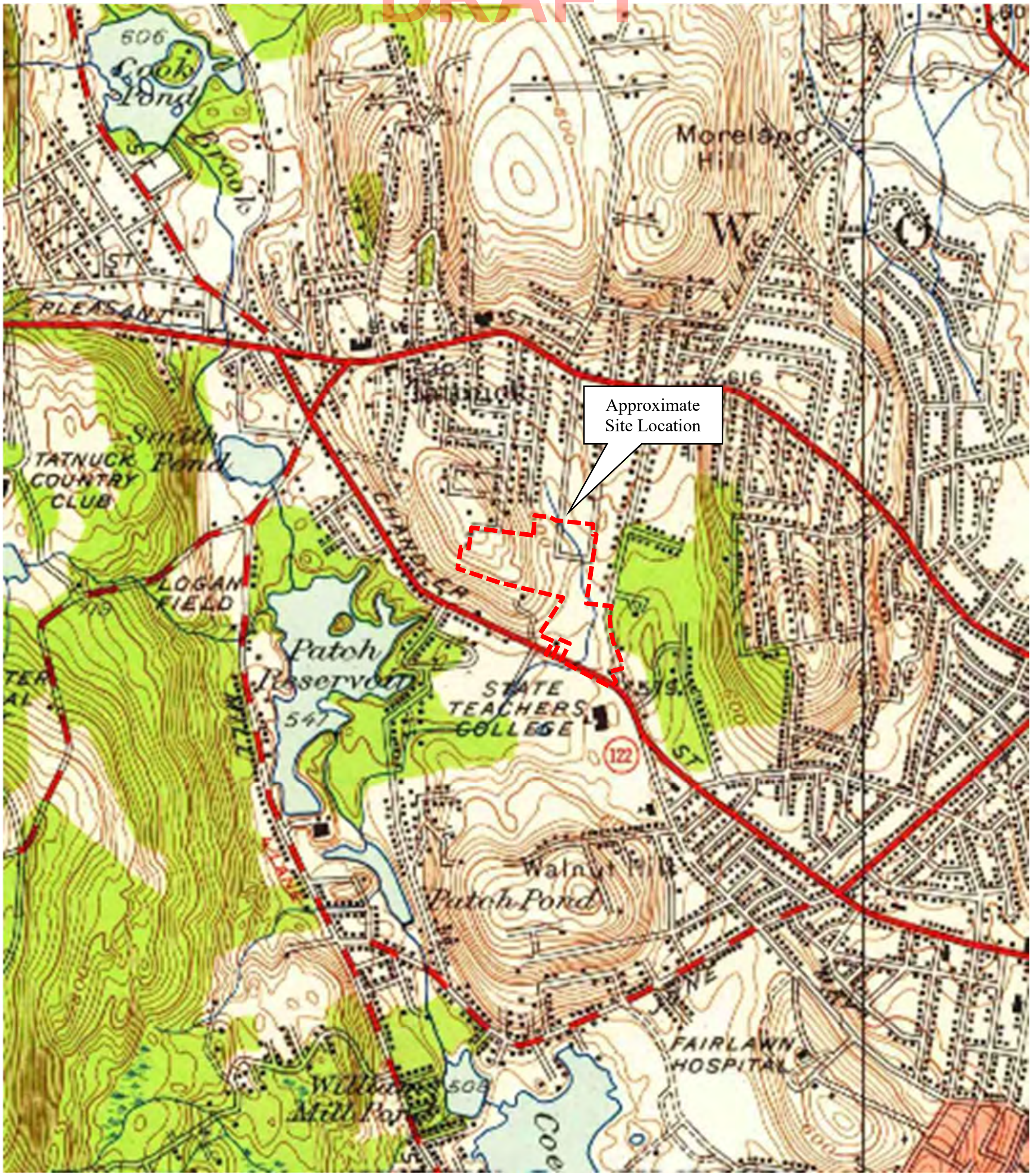
Attachment A – Historical Topo Maps



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Doherty High School	Figure A1 – 1886 Historical Topo Map (Chandler Site)
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1922	Date: Nov. 2019



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client:
Lamoureux Pagano & Associates, Inc.

Project:
Proposed Doherty High School

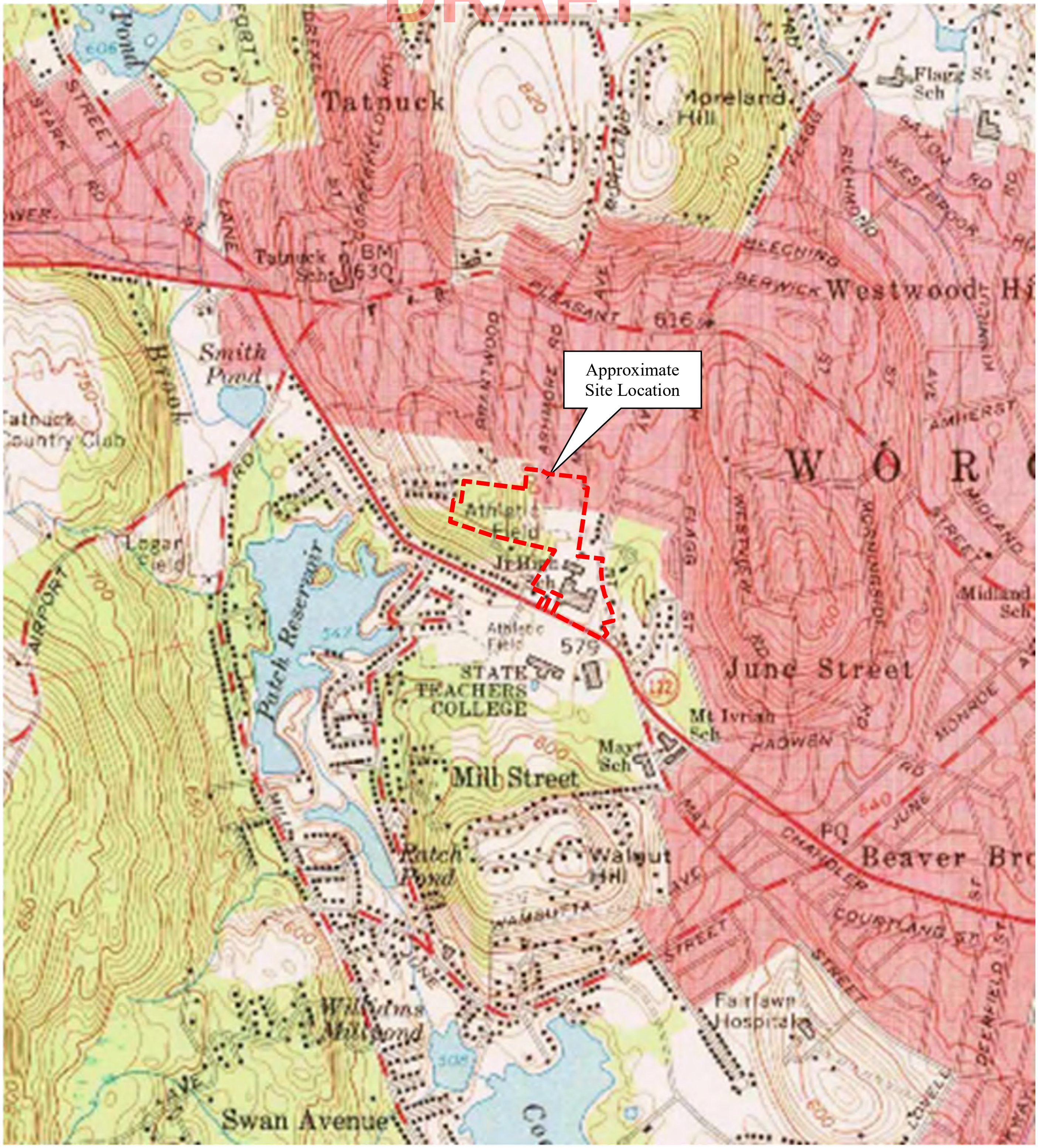
Figure A2 – 1948 Historical Topo Map (Chandler Site)

LGCI
Lahlaf Geotechnical Consulting, Inc.

Project Location:
Worcester, MA

LGCI Project No.:
1922

Date:
Nov. 2019



Contour Intervals: 3 meters

Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client:
Lamoureux Pagano & Associates, Inc.

Project:
Proposed Doherty High School

Figure A3 – 1960 Historical Topo Map (Chandler Site)

LGCI
Lahlaf Geotechnical Consulting, Inc.

Project Location:
Worcester, MA

LGCI Project No.:
1922

Date:
Nov. 2019

Attachment B – Photographs

Photo No. 1: View showing the existing flat field north of the existing building with a sharp increase in the grade East within the wooded area

Photo No. 2: Close up of the steep rise in the grade east of the existing field into the wooded area

Photo No. 3: View facing south showing the gradual rise in the grade from the existing building to the existing field

Photo No. 4: Close up of the sharp rise in grade within the wooded area East of the existing building

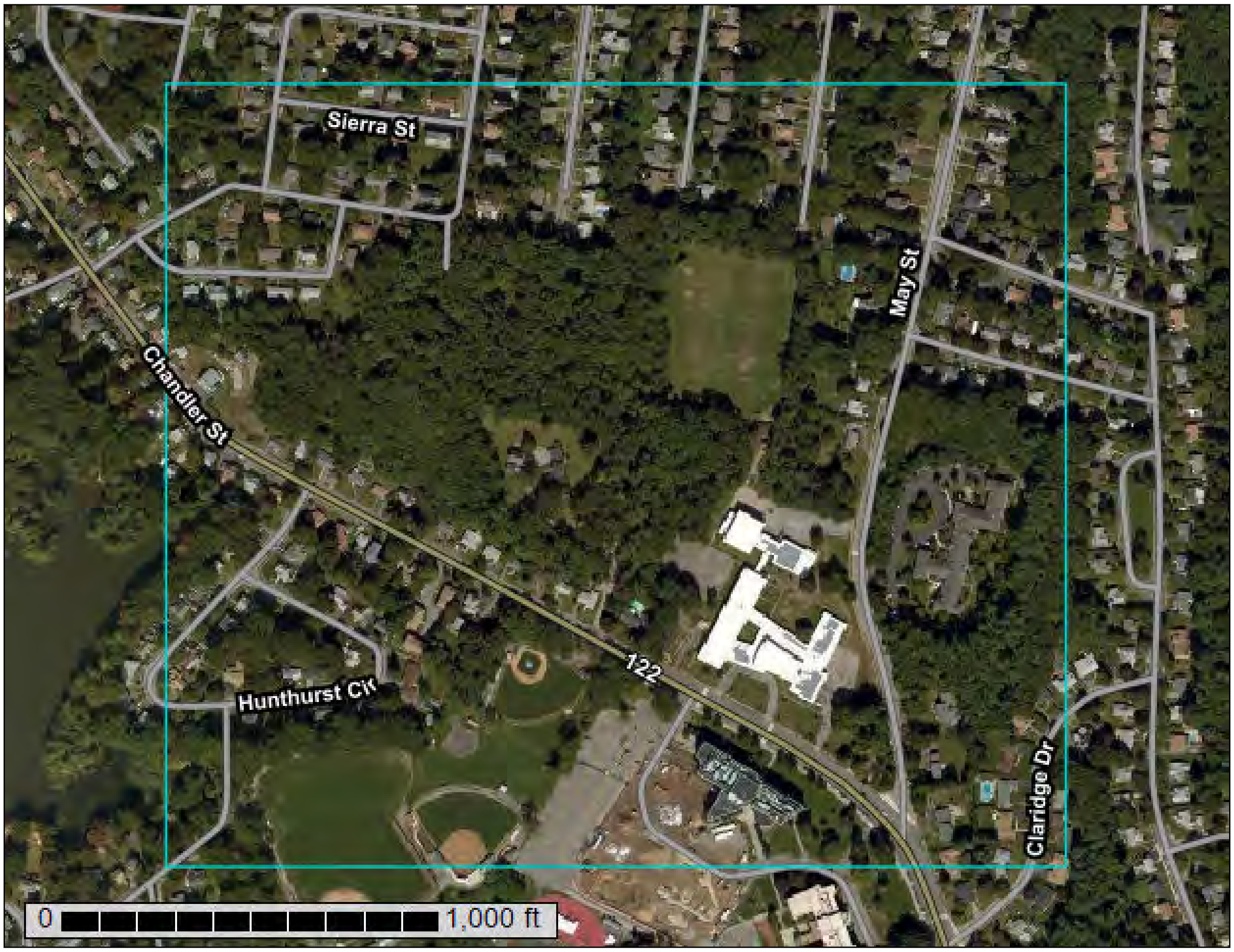
Attachment C – Excerpts of Soil Survey Report

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for
Worcester County, Massachusetts, Northeastern Part



November 15, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:5,360 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

▭ Soil Map Unit Polygons

〰 Soil Map Unit Lines

■ Soil Map Unit Points

Special Point Features

- Blowout
- ⊠ Borrow Pit
- Clay Spot
- ◇ Closed Depression
- ✕ Gravel Pit
- ∴ Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- ◎ Miscellaneous Water
- ○ Perennial Water
- ∨ Rock Outcrop
- + Saline Spot
- ⁙ Sandy Spot
- Severely Eroded Spot
- ◇ Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- △ Other
- Special Line Features

Water Features

〰 Streams and Canals

Transportation

- ┼┼┼ Rails
- 🟥 Interstate Highways
- 🟧 US Routes
- 🟨 Major Roads
- ⬜ Local Roads

Background

🟩 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 14, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	0.3	0.3%
31A	Walpole sandy loam, 0 to 3 percent slopes	4.0	3.5%
72A	Whitman loam, 0 to 3 percent slopes	1.1	0.9%
245C	Hinckley loamy sand, 8 to 15 percent slopes	8.2	7.2%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	7.5	6.6%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	23.0	20.1%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	21.7	19.0%
602	Urban land	3.0	2.6%
622C	Paxton-Urban land complex, 8 to 15 percent slopes	7.6	6.6%
625C	Hinckley-Urban land complex, 0 to 15 percent slopes	16.7	14.6%
651	Udorthents, smoothed	21.4	18.7%
Totals for Area of Interest		**114.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Worcester County, Massachusetts, Northeastern Part

1—Water

Map Unit Setting

National map unit symbol: w3qb
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Properties and qualities

Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

31A—Walpole sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkl
Elevation: 0 to 1,020 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Walpole and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Walpole

Setting

Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

Oe - 0 to 1 inches: mucky peat

A - 1 to 7 inches: sandy loam
Bg - 7 to 21 inches: sandy loam
BC - 21 to 25 inches: gravelly sandy loam
C - 25 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Sudbury

Percent of map unit: 10 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Scarboro

Percent of map unit: 10 percent
Landform: Deltas, outwash terraces, outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

72A—Whitman loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: w3r6
Elevation: 0 to 2,100 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitman and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitman

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 18 inches: fine sandy loam
H3 - 18 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: About 18 inches to densic material
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Ridgebury

Percent of map unit: 15 percent
Landform: Depressions
Hydric soil rating: Yes

Swansea

Percent of map unit: 15 percent
Landform: Bogs
Hydric soil rating: Yes

245C—Hinckley loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm9
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, kames, eskers, outwash terraces, kame terraces, outwash plains, moraines
Landform position (two-dimensional): Shoulder, toeslope, footslope, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Convex, concave, linear
Across-slope shape: Concave, linear, convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Kames, eskers, outwash terraces, moraines, outwash plains
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Moraines, kames, outwash terraces, eskers, kame terraces, outwash plains, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear, convex, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Outwash terraces, kame terraces, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, eskers, outwash terraces, moraines, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Outwash plains, deltas, kames, eskers
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Outwash plains, deltas, dunes, outwash terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash terraces, moraines, outwash plains, kames, stream terraces, eskers
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

305B—Paxton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2qp
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Paxton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Nose slope, crest, side slope
Down-slope shape: Convex, linear

Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent
Landform: Hills, drainageways, ground moraines, depressions
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

305D—Paxton fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2w67j
Elevation: 0 to 1,450 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 6 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent
Landform: Drumlins, drainageways, ground moraines, depressions, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

602—Urban land

Map Unit Setting

National map unit symbol: w3q8
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land

622C—Paxton-Urban land complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w67n
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 45 percent
Urban land: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 9 percent
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Canton

Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 3 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent
Landform: Ground moraines, depressions, hills, drumlins, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: Yes

625C—Hinckley-Urban land complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm1
Elevation: 140 to 770 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 45 percent
Urban land: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Kame terraces, outwash plains, moraines, outwash deltas, kames, eskers, outwash terraces
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope, summit
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

A - 0 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 10 percent
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Outwash terraces, moraines, outwash plains, kame terraces, kames, eskers
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope, head slope, riser, tread
Down-slope shape: Convex, concave, linear
Across-slope shape: Concave, convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Eskers, kame terraces, outwash plains, outwash deltas, moraines, kames, outwash terraces
Landform position (two-dimensional): Footslope, shoulder, toeslope, backslope, summit
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Linear, concave, convex
Hydric soil rating: No

651—Udorthents, smoothed

Map Unit Setting

National map unit symbol: w3q6
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 80 percent
Urban land: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Parent material: Made land over firm loamy basal till

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Urban Land

Properties and qualities

Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

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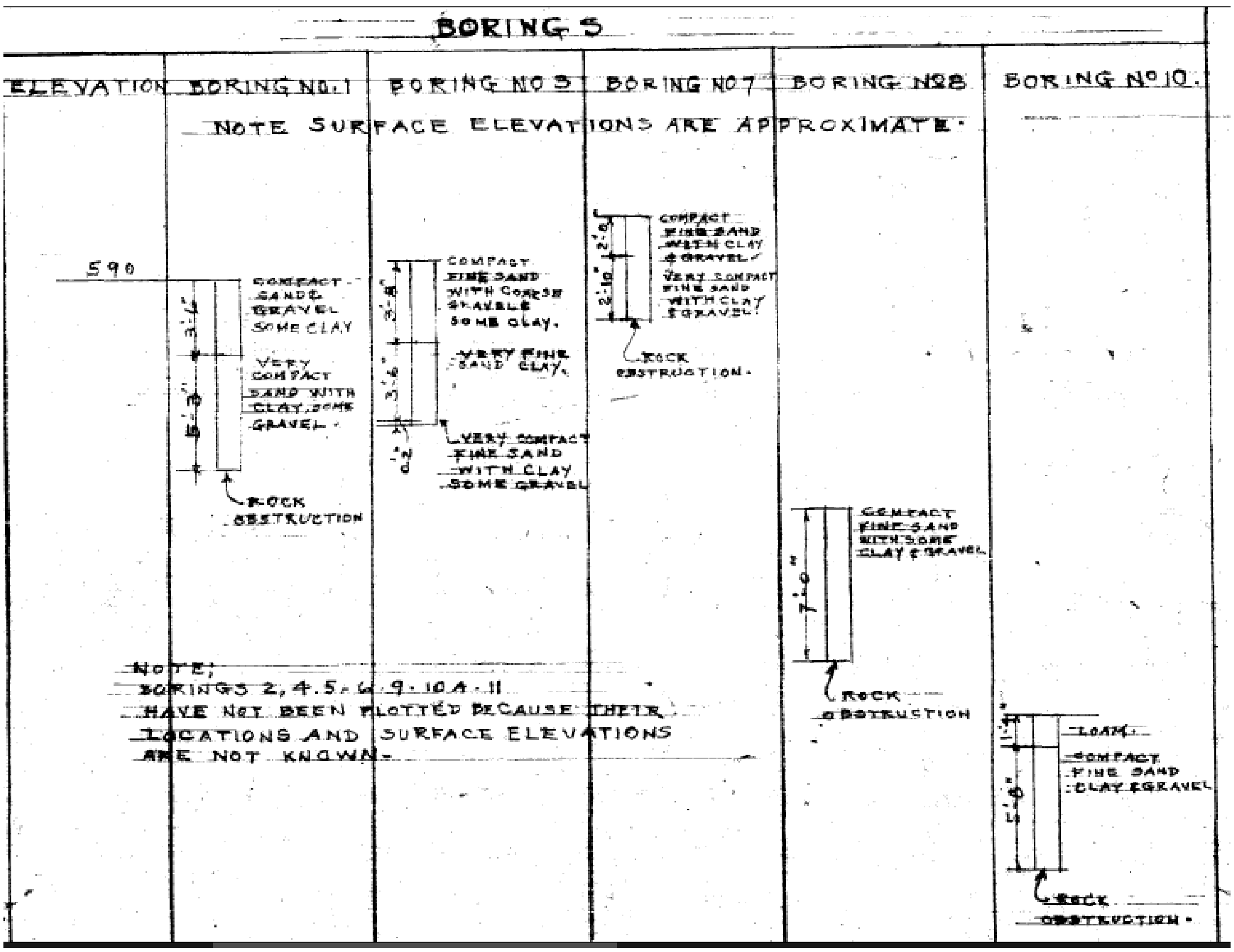
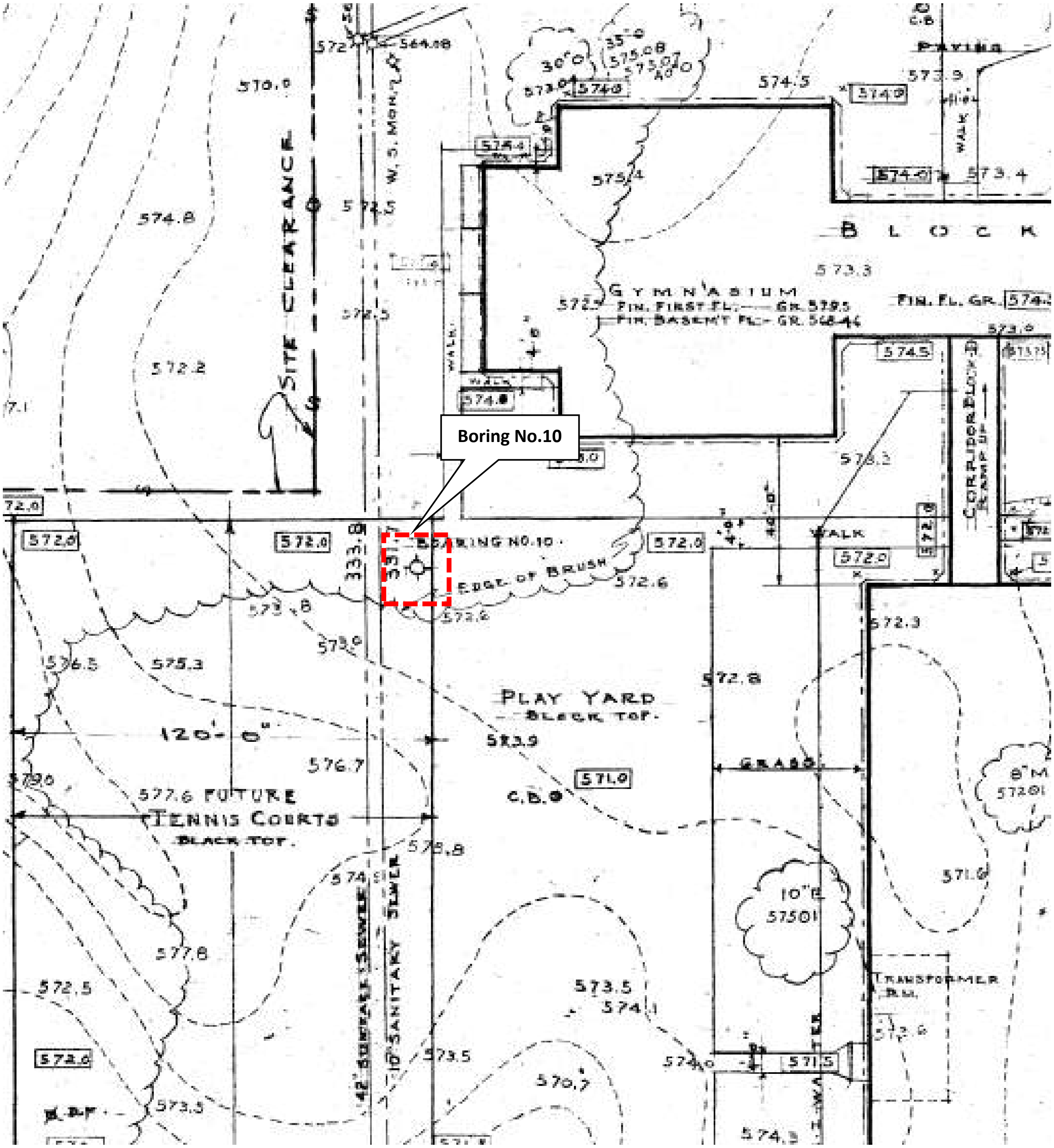
Attachment D – Locations and Logs of Previous Borings

Boring Logs & Boring Locations

(Chandler Site)





Boring No.10

SITE CLEARANCE
W. S. MON.
GYMNASIUM
FIN. FIRST FL. - GR. 579.5
FIN. BASEM'T FL. - GR. 568.46
BLOCK
FIN. FL. GR. 574.
CORRIDOR BLOCK B
RAMP UP
WALK
PAVING
BORING NO.10
EDGE OF BRUSH
PLAY YARD
BLACK TOP
C.B.
120'-0"
FUTURE TENNIS COURTS
BLACK TOP
42" SURFACE SEWER
10" SANITARY SEWER
GRASS
10" E
8" M
TRANSFORMER RM.
WATER
333.8
331.
40'-0"
574.8
572.2
570.0
572.5
573.3
574.5
574.0
573.9
573.4
575.4
572.0
572.6
572.3
572.8
573.8
573.0
575.3
576.5
576.7
577.6
577.8
573.9
571.0
571.5
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570.7
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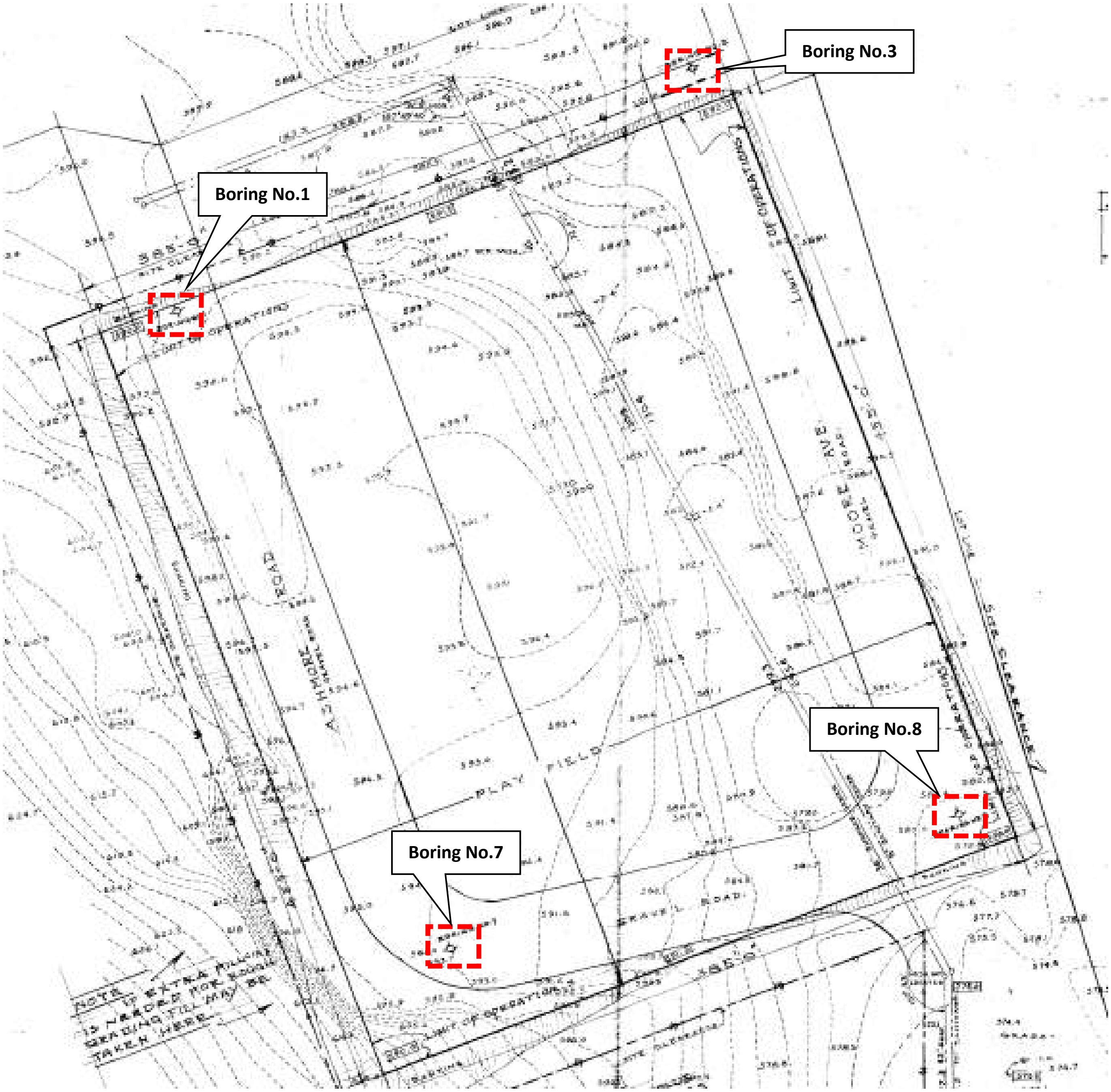
572.6
573.5
564.08
575.08
575.07


Boring No.3
Boring No.1
Boring No.8
Boring No.7
LIMIT OF OPERATIONS
ASHMORE ROAD
MOORE AVE
PLAY FIELD
GRAVEL ROAD
SITE CLEARANCE
NOTE: EXTRA FILL IS NEEDED FOR ROAD GRADING FILL MAY BE TAKEN HERE

3.3.3 FINAL EVALUATION OF ALTERNATIVES

A. Narrative Summary
B. Updated Existing Site Analysis & Site Program
C. Preliminary Design Options
D. Supporting Documents
E. Budget Comparison
F. Summary of Merits & Limitations

3.3.3 FINAL EVALUATION OF ALTERNATIVES

A. Narrative Summary

The PDP identified the following five options for further development during the Preliminary Schematic Report (PSR) phase of this Feasibility study:

- **Code Upgrade Option**
- **Renovation/Addition Option**
- **New Construction on Existing Site**
- **New Construction on Foley Stadium Site**
- **New Construction on Chandler Magnet School Site with Added Land**

The individual options' narratives included in this section have the following information as appropriate for each option:

- SUMMARY
- PHASING
- CONSTRUCTION IMPACTS
- PARTI DIAGRAM
- BUILDING ORGANIZATION
- SITE CONFIGURATION
- OPTION ANALYSIS
- ABILITY TO MEET BUILDING PROGRAM
- ACQUISITION ISSUES
- COMPARATIVE STAFF AND STUDENT IMPACT
- ABILITY TO MEET SITE ATHLETICS PROGRAM
- CENTRAL TO DISTRICT/QUADRANT
- SITE DEVELOPMENT COSTS
- TRAFFIC IMPACTS & ACCESS
- BUS & PARENT VEHICULAR CIRCULATION & PARKING
- CONSTRUCTION SCHEDULE IMPACT
- ADJACENT USES & NEIGHBORHOOD IMPACT
- UTILITIES & DEVELOPMENT ISSUES
- ADDITIONAL CITY COSTS (NOT ELIGIBLE FOR MSBA REIMBURSEMENT)
- SCOPE OF WORK

Accompanying each of the options' narratives there are drawings of the site, preliminary building layout, pedestrian & vehicular circulation, and a construction phasing diagram when relevant.

3.3.3 FINAL EVALUATION OF ALTERNATIVES

B. Site Development Requirements

3.3.3.B Site Development Requirements

1.0 INTRODUCTION

Nitsch Engineering has prepared this Site Development Requirements narrative as part of a Massachusetts School Building Authority (MSBA) Module 3 - Feasibility Study for the redevelopment of Doherty Memorial High School in Worcester, MA. The report corresponds to the MSBA Module 3 Preferred Schematic Report (PSR) and focuses on elements that relate specifically to the site development aspects of the Feasibility Study.

2.0 SITE DEVELOPMENT REQUIREMENTS

2.1 General

The site development requirements are based on the educational and extracurricular programming that was established by the City of Worcester and further reviewed and refined by the Steering Committee. Certain project conditions and logistics may affect the scale and fulfillment of some of the site development requirements, depending on the development alternative eventually selected for advancement. For example, the lack of available swing space for displaced students may restrict the scale and configuration of certain site development features such as access, parking, and circulation. Under any redevelopment alternative, the site development plan and phasing approach must be capable of maintaining the existing Doherty School programs in operation during construction with appropriate measures for safety of the students and separation of the contractor functions from the school activities. The following sections include site development objectives, some of which are required due to regulatory conditions as noted.

2.2 Access, Circulation, and Parking

Pedestrian / Bicycle Access

Approximately 50% of the students (800 walkers) currently access the existing Doherty site on foot and that ratio is expected to apply to the redevelopment project. This includes morning drop-offs by parents and students walking to school. Fewer parent pick-ups occur in the afternoon and most of the walkers are students who walk home at the end of the school day. The heavy pedestrian access will require a significant focus on sidewalk connections and broad interconnected internal site pathway circulation.

The existing Doherty site and the alternative sites identified in Section 4.0 include close proximity to Worcester Regional Transit Authority (WRTA) bus stops. Safe connections from all WRTA bus stops to the school building will be required.

A smaller number of students access the existing Doherty site via bicycle, and a bike rack with a minimum of 12 racking spaces is needed.

All pedestrian access from the public ways to the school must be compliant with ADA/AAB accessible route requirements and should be distinct and separate from vehicle accesses and circulation.

Bus Access

Access and stacking capacity for 10 full-size buses adjacent to the main school entrance is required. Access and stacking for 6 half-size buses adjacent to the main entrance for special education students is also required, non-coincident with the full-size bus arrivals and departures. Bus access should ideally be separated from ordinary passenger vehicle access, although shared site entrance and exit curb cuts may be acceptable/desirable.

Passenger Vehicles

Access and internal circulation for passenger vehicles should be separated from bus circulation. Stacking for approximately 20 passenger vehicles for parent drop-off / pick-up are needed.

Emergency Vehicles

Access drives and internal circulation drives must be wide enough to accommodate fire apparatus and other emergency vehicles with passenger vehicles present. Access to the perimeter of the building via a 20'-wide emergency drive is needed per the requirements of NFPA 1 as amended by 527 CMR 1.00.

Service Vehicles

A depressed loading dock providing tractor trailer access is required for building deliveries/servicing is required and should be separated from bus and passenger vehicle access to the greatest extent possible. The loading dock area should provide access for at least 4 bays (compactor, recycling dumpster, 2 tractor trailers). Ramp access to the loading dock for two-wheel carts should be provided.

The building will require overhead door access for maintenance equipment and to access the boiler room. Overhead door access and outdoor space will also be required to accommodate the needs of the various Chapter 74 programs that are included in the educational programming for the school.

Parking

The desired parking program will include:

- 180 staff spaces ideally within close proximity to building entrances, with designated spaces near main entry for: Principal, 4 Assistant Principals, 2 Nurses;
- 5-10 visitor spaces near main entrance; and
- 250 combined visitor and student spaces (this is a target number and could be reduced if site conditions are prohibitive).

As noted previously, some shared parking for Elm Park (Newton Hill) visitors is provided at the existing site. This shared parking is assumed to be included under any redevelopment scenario on the existing site. No additional parking would be available for events at the school.

2.3 Athletic Facilities (Site)

The elements of the on-site athletic facilities will be heavily influenced by the physical characteristics of the selected development option, including variations on the existing Doherty site or alternative sites. Ideally, all athletic fields will be located on the same site. If spatial constraints prevent the full array of fields, the preferred prioritization includes a football/general purpose field on the site, with other facilities potentially located remotely. The elements listed below are objectives in terms of type, number, and content of athletic facilities desired by the City.

- Practice Football Field: 360'x160' artificial turf football field, pole mounted lights, close access to school toilet rooms;
- Softball Field: skinned infield, regulation-sized outfield;
- Baseball Field: regulation-sized field;
- Soccer Field: boys and girls 240' x 120';
- Basketball Courts: 2 full-size asphalt, lighted courts;

- Tennis Courts: 3 full-size asphalt, lighted courts;
- Running Track: 400m/8 lane running track; rubber track, pole mounted lights; close access to school toilet rooms, multi-vantage press box;
- Spectators: seating (bleacher) capacity for each game field; and
- Adjacent Uses: trail connection to the existing park trails (where applicable).

2.4 Other Site Features and Project Conditions

The School program outlines other items to be developed with the site including:

- Outside work areas for the Chapter 74 Construction Craft Laborer program and overhead door access to the shop,
- Outside access for the Engineering and Technologies academy shops,
- Connection to the existing pathways / trail system at Newton Hill (for Doherty site), and
- Site development and phasing capability sufficient to maintain the existing Doherty School programs in operation during construction with appropriate measures for safety of the students and separation of the contractor functions from the school activities (for Doherty site).

2.5 Site Utilities

Storm Drainage

Under any redevelopment scenario, a stormwater management system meeting the requirements of the City of Worcester requirements (and by extension, the Massachusetts Department of Environmental Protection Stormwater Standards) will be required for the project. The improved system will include provisions for groundwater recharge, peak flow mitigation, and water quality treatment.

Sanitary Sewerage

Separated sanitary sewer connections from the school building will be required under any redevelopment scenario and will include a kitchen waste service pipe and one or more ordinary sanitary service pipes. The kitchen waste pipe will be routed through an external grease trap prior to connection with the rest of the sewer service infrastructure. All floor drains in building areas that are accessible by motorized vehicles and equipment must be connected to a gas/oil separator per state plumbing code requirements.

Water

Except for the Code Upgrade Option, any site redevelopment option will likely require installation of a new looped water service main that will provide fire protection (building service and hydrants) and domestic water service to the building.

Natural Gas

The school building (existing or new) will utilize natural gas as a primary fuel source. Refer to the mechanical engineering narrative for information related to the building fuel system.

Electrical / Tele-comm

An emergency generator will be required under any development scenario. Photovoltaic arrays may be considered for the building roof and/or parking areas. Refer to the electrical engineering narrative for information related to the building electric and telecommunications systems.

3.3.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options

1. Code Upgrade Option

- a. Narrative
- b. Site Plan
- c. Building Floor Plans

SUMMARY:

For purposes of this Feasibility Study, the Code Upgrade Option is defined as a "No-Build" solution that will maintain the status quo. It will not provide any additional square footage or address education or site programmatic improvements to the existing School. In this option, temporary modular classrooms (located on West side of the site near the existing cafeteria area) are required to partially draw down the student population while phased renovations are performed in separate work areas of the existing building. The Code Upgrade Option addresses pre-existing code violations, improvements required due to scope-of-work code thresholds, and the repair/replacement of existing building systems that have either exceeded their life expectancy or have already failed. It also addresses items that should be replaced as the result of related work being performed in close proximity (for instance the replacement of existing ACT, lighting, data/communication, life safety and other in/above-ceiling systems that must first be removed to install a new fire suppression system). It also will address the abatement of hazardous materials. The following Code Upgrade scope of work is based on a thorough assessment of existing building systems by the Design Team. Proposed SF areas for this option are approximately as follows:

Renovation (existing building)	**= 167,000 GSF**
Add modular units for Swing Space	**= 30,000 GSF**

PHASING:

PHASE 1 (3/2022 to 8/2022):

- Provide temporary modular Classrooms, temporary connection to the school and associated sitework
- Mobilize and begin renovation preparations
- Renovate corridors and stair common areas using double shifts
- Perform sitework scope for an accessible route from Highland Street to Building 1 Main Entry

PHASE 2 (8/2022 to 12/2022):

- Continue renovations to building 2 floor 2 areas
- Renovate gym during summer vacation using double shifts
- Perform related sitework scope for building 2

PHASE 3 (1/2023 to 6/2023):

- Renovate building 2 floor 1 areas
- Renovate auditorium areas during summer vacation using double shifts
- Perform related sitework scope from building 2 to building 1

PHASE 4 (6/2023 to 12/2024):

- Renovate building 1 floor 2 areas
- Renovate cafeteria during summer vacation using double shifts
- Perform related sitework scope for building

PHASE 5 (1/2025 to 3/2026):

- Renovate building 1 floor 1 areas
- Renovate remaining common areas and complete sitework scope
- Demobilize

COMPARATIVE STAFF AND STUDENT IMPACTS:

- In general terms, the Code Upgrades "Base Repair" option will expose students and staff/faculty to a lengthy and difficult construction sequence. Temporary modular classrooms are remote from most common-use areas and require lengthy travel distances between periods. Despite the best planning, there will be times when building systems will be interrupted or out of service. Most non-classroom spaces (including but not limited to Life Skills, Administrative, Guidance, Medical, Music, Art and Media Center) will require at least one or more relocations over the duration of construction. Temporary partitions and stairways will be required to separate CM work areas from occupied educational spaces.
- For purposes of developing phasing plans and cost estimating, we have assumed that the existing Kitchen/Serving spaces will remain in operation until the renovated Kitchen/Serving/Cafeteria spaces are complete and functional. However, there will be a period of time when temporary Cafeteria space (such as the Auditorium, Gym) is required.
- Most outdoor spaces including parking and PE/Athletic fields will be impacted to some extent for the full duration of construction. All practice field activities will most likely need to be relocated for the duration of construction.

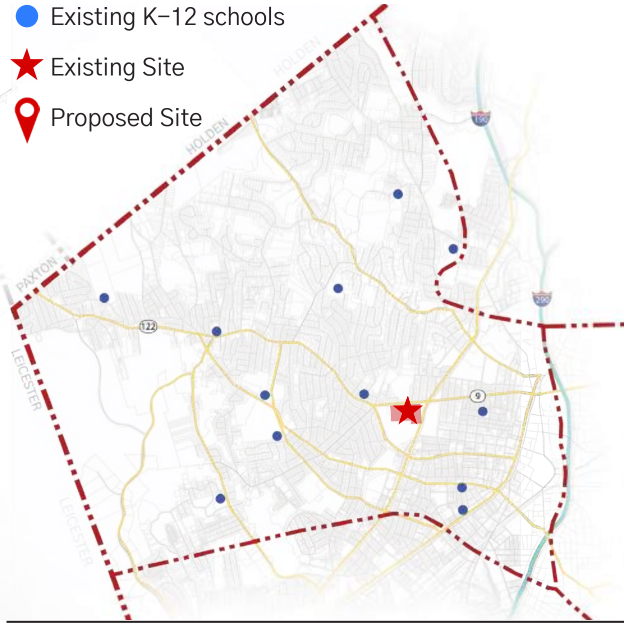
3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
1. Code Upgrade
b. Site Plan

NOTES:

- Does not address Educational Program or Site Program
- Extended Construction Schedule (4–5 Years)
- Modular Classroom Costs
- Greatest impact to staff and students

QUADRANT KEY PLAN:

● Existing K–12 schools
★ Existing Site
📍 Proposed Site

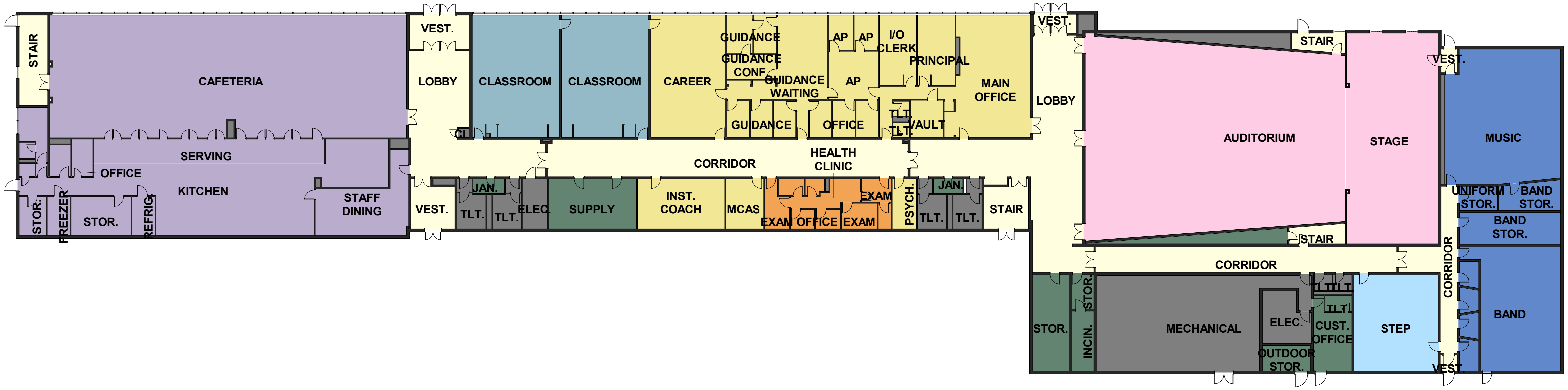


LEGEND:

- Parcel Property Line
- Potential acquisition
- Temp. Construction
- New Athletic Field
- Existing Building to be demolished
- Existing Building to be renovated
- Retaining Wall
- Steep Topography
- Entrance
- New Roadway
- Bus Circulation
- Parent Circulation
- Connection
- Utility

N
0' 50' 100' 200'

LPA|A



Existing First Floor Plan

1" = 40'-0"

LEGEND

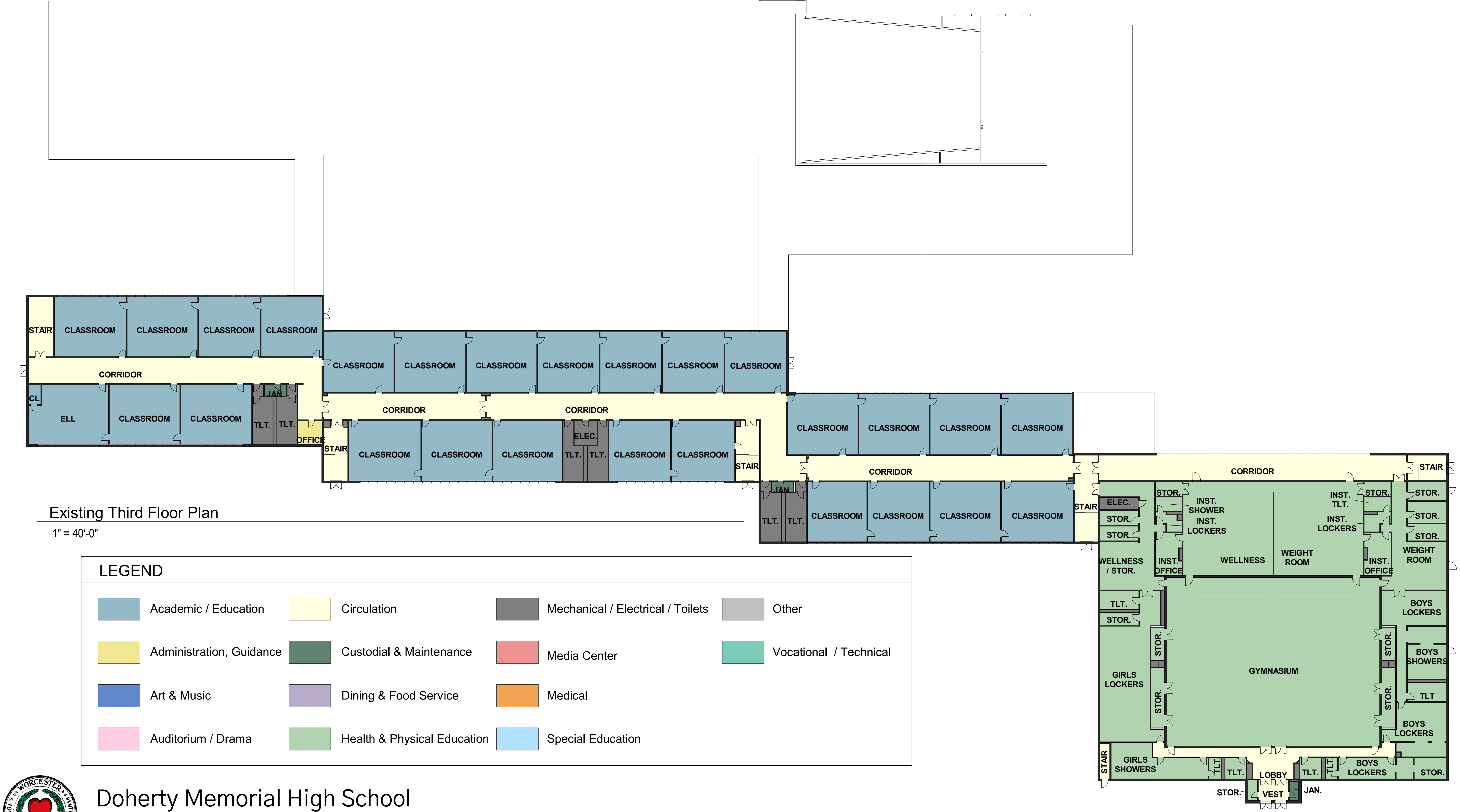
- ■ Academic / Education
- ■ Administration, Guidance
- ■ Art & Music
- ■ Auditorium / Drama
- ■ Circulation
- ■ Custodial & Maintenance
- ■ Dining & Food Service
- ■ Health & Physical Education
- ■ Mechanical / Electrical / Toilets
- ■ Media Center
- ■ Medical
- ■ Special Education
- ■ Other
- ■ Vocational / Technical

Existing Second Floor Plan

1" = 40'-0"

LEGEND

- Academic / Education
- Administration, Guidance
- Art & Music
- Auditorium / Drama
- Circulation
- Custodial & Maintenance
- Dining & Food Service
- Health & Physical Education
- Mechanical / Electrical / Toilets
- Media Center
- Medical
- Special Education
- Other
- Vocational / Technical



Existing Third Floor Plan

1" = 40'-0"

LEGEND

Academic / Education	Circulation	Mechanical / Electrical / Toilets	Other
Administration, Guidance	Custodial & Maintenance	Media Center	Vocational / Technical
Art & Music	Dining & Food Service	Medical	
Auditorium / Drama	Health & Physical Education	Special Education	

Doherty Memorial High School

299 Highland Street, Worcester, MA 01602

3.3.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options

2. Renovation/Addition Option

- a. Narrative
- b. Site Plan
- c. Floor Plans
- d. Massing
- e. Phasing Plans
- f. Design/Construction Schedule

SUMMARY:

The Renovation/Addition Option faces two challenging conditions that also resurface for new construction options. The first is the site and the second is the absence of swing space options. The site is already constrained in its current state and any construction would compromise daily activities. Additionally, the topography of adjacent Newton Hill limits site development opportunities. The strategic use of modular classrooms to facilitate the construction sequence while maintaining the existing school operation is included for this option with the understanding that relocation may be required in the sequence.

With those factors in mind, the design approach aims to keep the classrooms in both academic wings, and replace the core/community spaces. Although the existing academic wings have a low floor to floor height, these spaces would account for approximately 75% of the typical classroom space needs after completion. To accomplish this, a large addition built on the easterly side of the site would have to be built first. This addition would also build-in swing space capacity that would kick-off the multi-phased renovation of the school. The next sequence would involve occupying newly constructed space, demolition of antiquated spaces and rebuilding new in place. This process would repeat until complete, with varying degrees of addition / renovation scope. The unavoidable detriment to this scheme is that the academics are split between the core spaces with the 9th Grade Teams, Science Labs, and Engineering Technology Academy in a building wing opposite from the math and humanity departments. The completed project would account for all spaces in the educational program, but its organization is compromised. The scope would include complete replacement of all systems, while maintaining the existing systems at areas until renovated where possible. The following Renovation / Addition scope of work is based on a thorough assessment of existing building systems by the Design Team. Proposed SF areas for this option are approximately as follows:

▪ **Renovation (existing building)**	**= 101,000 GSF**
▪ **Demolition (existing building)**	**= 66,000 GSF**
▪ **Addition**	**= 319,000 GSF**
Total	**= 420,000 GSF**

RENOVATION/ADDITION PHASING:

Enabling Early Site Package (3/2022 to 8/2022):

- excavation of practice fields for new construction, parking, and contractor staging
- adding temporary retaining along Highland street for temporary parking

- Excavation and installation of permanent retaining walls at the rear of the building for temporary parking and permanent perimeter access.
- Perform sitework scope including new utilities/infrastructure

PHASE 1 (6/2022 to 7/2024):

This phase is primarily focused on the bulk of addition scope of work involving a multi-level addition on the east end of the existing school. The existing school is to remain with limited to no internal impact this phase.

- Mobilize on site; create a fenced dedicated construction access driveway around easterly portion of existing building; prepare former practice field as CM/Subcontractor area for temporary facilities, storage, parking, etc.
- Construct multi-level (up to 4-story) addition at east end of building; refer to drawing graphics section 3.3.3.C.2.b-e for additional information
- Build out new mechanical/electrical rooms to serve entire building (including additions)
- Create a temporary link through the Music Department to the Addition; refer to drawing graphics section 3.3.3.C.2.b-e for additional information
- Perform sitework scope including new utilities (continued)

PHASE 2 (6/2024 to 8/2025):

This phase is three-fold and is summarized as follows:

1. Sequence 2A will involve occupancy of phase 1 constructed spaces for the Fall of 2024
2. Sequence 2B involves hazardous material abatement and selective demolition of the existing building during the Summer 2024; refer to drawing graphics section 3.3.3.C.2.b-e for additional information
3. Sequence 2C involves new construction addition to the former easterly end of the building, the new center of the school building; refer to drawing graphics section 3.3.3.C.2.b-e for additional information

Phase 2 Notes:

- Receive and install FF&E in the Summer prior to Fall 2024 occupancy
- Hazardous abatement and demolition to occur during summer months of 2024. Double shifts to be utilized to minimize these types of activities during active school sessions. Perform associated structural/exterior envelope work following demolition activities.
- Perform related sitework scope during 2025 summer vacation including vehicular access driveway to new main school entry and site prep for new additions at west end of building

PHASE 3 (6/2025 to 12/2025):

This phase is three-fold and is summarized as follows:

1. Sequence 3A will involve occupancy of phase 2 constructed spaces for the Fall of 2025
2. Sequence 3B involves hazardous material abatement and selective demolition of the existing building during the Summer 2025; refer to drawings for additional information
3. Sequence 3C involves renovation of both floors to north academic wing with a small addition to the western end

Phase 3 Notes:

- Hazardous abatement and demolition to occur during summer months of 2025. Double shifts to be utilized to minimize these types of activities during active school sessions. Perform associated structural/exterior envelope work following demolition activities.
- Construct new additions at west end of building
- Renovate north academic wing; abate, demolish and renovate into new academic spaces; refer to drawing graphics section 3.3.3.C.2.b-e for additional information
- Perform sitework scope including new driveway to Construction Craft Laborer Shop Addition

PHASE 4 (1/2026 to 8/2026):

This phase is three-fold and is summarized as follows:

1. Sequence 4A will involve occupancy of phase 3 constructed spaces for the Fall of 2026
2. Sequence 4B involves hazardous material abatement and selective demolition of the existing building during the Summer 2026; refer to drawings for additional information
3. Sequence 4C involves renovation of both floors to south academic wing with a small addition to the western end; refer to drawing graphics section 3.3.3.C.2.b-e for additional information

Phase 4 Notes:

- Hazardous abatement and demolition to occur during summer months of 2026. Double shifts to be utilized to minimize these types of activities during active school sessions. Perform associated structural/exterior envelope work following demolition activities.
- Construct new additions at west end of building
- Renovate north academic wing; abate, demolish and renovate into new academic spaces; refer to drawing graphics section 3.3.3.C.2.b-e for additional information
- Perform final sitework scope
- Demobilize
- Receive and install remainder of FF&E
- Occupy final phase, south wing, over the summer of 2027

ABILITY TO MEET BUILDING PROGRAM: The Renovation/Addition Option will satisfy the majority of Educational Program/Space Summary objectives. Several items of note include the following:

- To meet the Education Program, due to all the existing spaces being deficient in size, this scheme is close to a complete reconstruction of the building in mix of additions and renovations
- Academic areas are split into two areas and on opposite ends of the building layout as a result of site constraints.
- The Site Program, circulation, practice fields and parking will be displaced throughout construction activities and change as the project delivery evolves.
- The efficiency factor of a Renovation/Addition solution will be less than that of New Construction due to existing structure (particularly low 11'-4" floor to floor height), in the north and south academic wings
- Sustainability goals are more readily achieved with New Construction than with the Renovation/Addition of an existing building.
- Full building code compliance, in terms of structure, accessibility, energy and life safety, will be more difficult to achieve in an existing building than with New Construction. Variances and/or compliance alternatives may be warranted if full compliance with applicable codes is impractical.
- Adjacencies between spaces and to the exterior may not meet ideal program goals, but are not seen as detrimental to the extent that a Renovation/Addition solution should be dismissed

COMPARATIVE STAFF AND STUDENT IMPACTS:

- There is a high level of structural, building system and exterior envelope work associated with the selective demolition proposed for this option; it will be an intensive effort to coordinate and accomplish that work while adjacent areas are occupied.
    - For example, at the gym and auditorium are proposed to be demolished, removed and replaced. This work cannot be performed while adjacent spaces are occupied; occupants should be relocated into the new primary addition or elsewhere in the existing building. The existing structure that remains will need significant improvements (i.e. seismic bracing and expansion joints) in order to maintain structural capacity as an integral element of an occupied building.
    - Another impact related to demolition is the creation of new exposed-to-exterior structure at previously interior locations. Existing interior columns typically bear on pier footings that generally do not extend below frost depth or have continuous frost walls. When those previously interior footings are made part of an exterior wall assembly, they require frost protection; either by adding continuous reinforced concrete frost walls or by changing the exterior grade to provide additional depth. The

columns, beams and slabs along the lines of newly-created exterior walls will also require modifications (i.e. steel bent plates, clips, reinforcing dowels, slab extensions, etc.) to support the new exterior envelope systems. Refer to the updated Structural Basis of Design Narrative for more information.

- Existing building systems that pass through an area slated for demolition must be temporarily rerouted or replaced to avoid service interruptions. Examples include sanitary and roof drain piping (risers and below grade), electrical/communication conduits and wiring, ductwork, domestic water supplies, etc.
- Egress routes must remain in place for the occupant loads served. Temporary fire-rated partitions, corridors, stairs and life safety systems may be required to comply with code requirements.

- This option requires abatement of hazardous cavity wall damp proofing where existing exterior walls are removed.
- For purposes of developing phasing plans and cost estimating, we have assumed that the existing Kitchen/Serving spaces will remain in operation until new Kitchen/Serving/Cafeteria spaces are complete and functional.
- During Phase 1, parking and site circulation will be impacted the most
- Many outdoor spaces including parking and PE/Athletic fields will be unavailable for the full duration of construction.

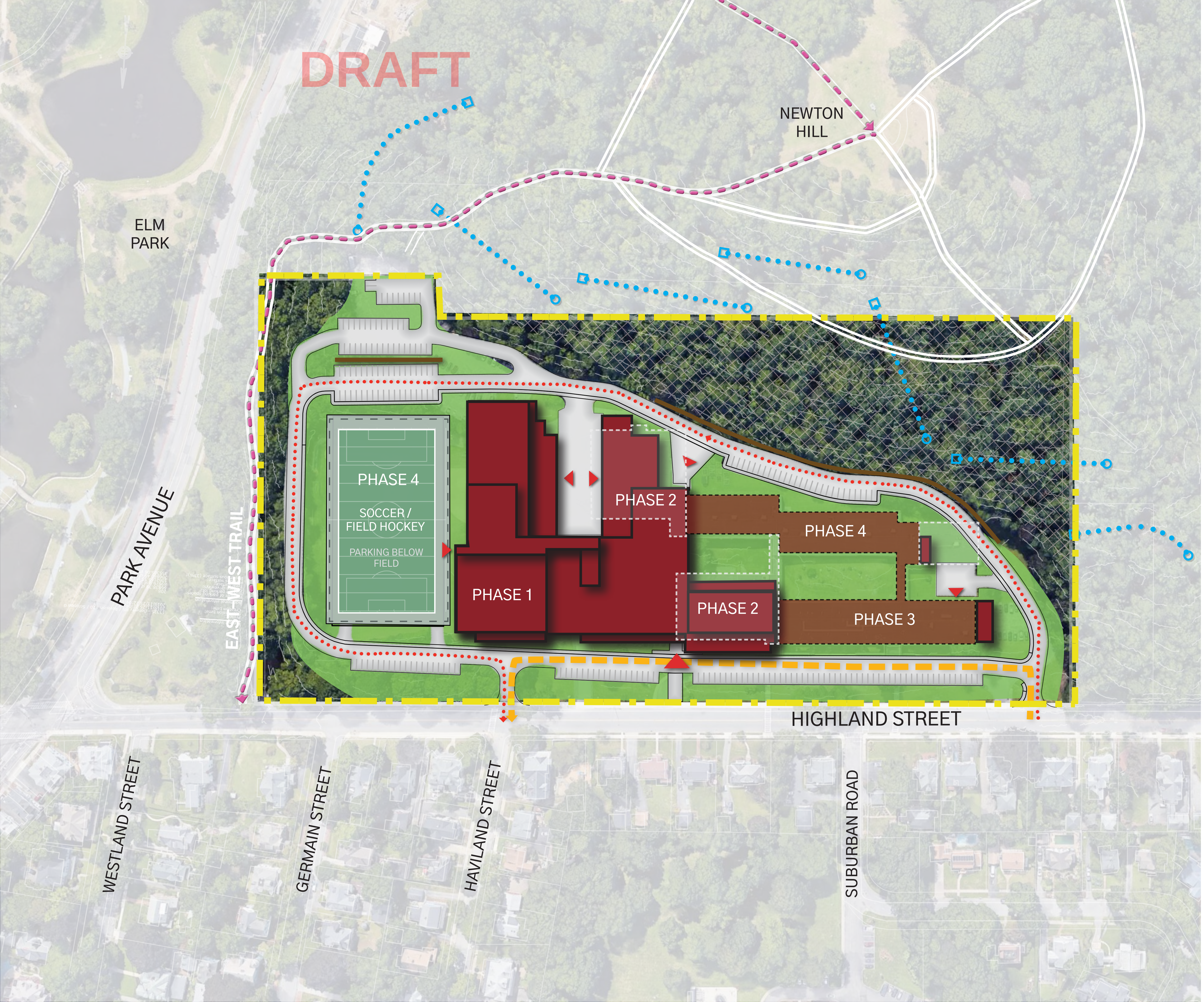
ADDITIONAL CITY COSTS (NOT ELIGIBLE FOR MSBA REIMBURSEMENT):

LPA|A reviewed opportunities to supplement Doherty's athletic fields, both during construction and after completion. One option for expansion is the addition of a rectangular football/soccer/field hockey field at the existing nearby Duffy Softball Field. Other City offsite scope may include improvements for traffic management and pedestrian crosswalks.

Additional considerations include:

- Temporary Off-Site parking through construction
- Newton Hill trail improvements
- Improved Access to Foley Field (land cost of rear land of three Abbott Street parcels)
  - Development of added land with new basketball or tennis courts and Surface Parking
- Beaver Brook practice field improvements (underdrains)
- Foley Stadium Improvements to Rear Fields

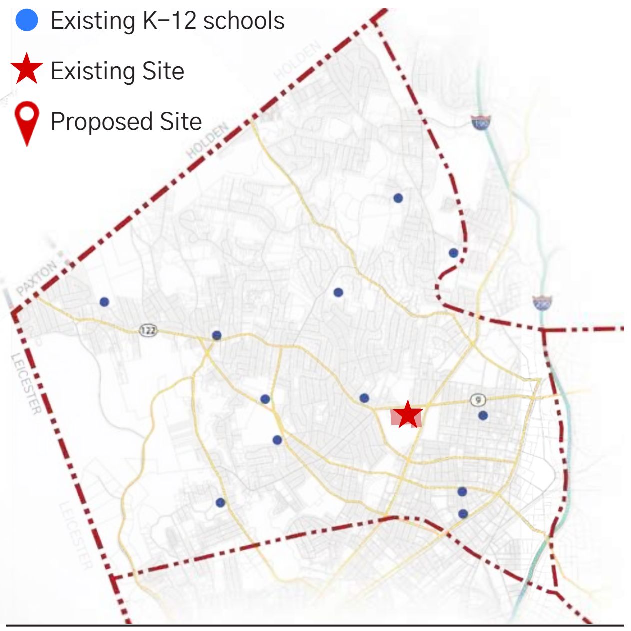
The total added city costs for this Option would range between $6–11 Million. Refer to Section 3.3.3.D.3 Offsite improvements for more information.



NOTES:

- Compromised educational program
- Extended Construction Schedule (4–5 Years)
- Parking deck below field
- Greatest impact to staff and students

QUADRANT KEY PLAN:

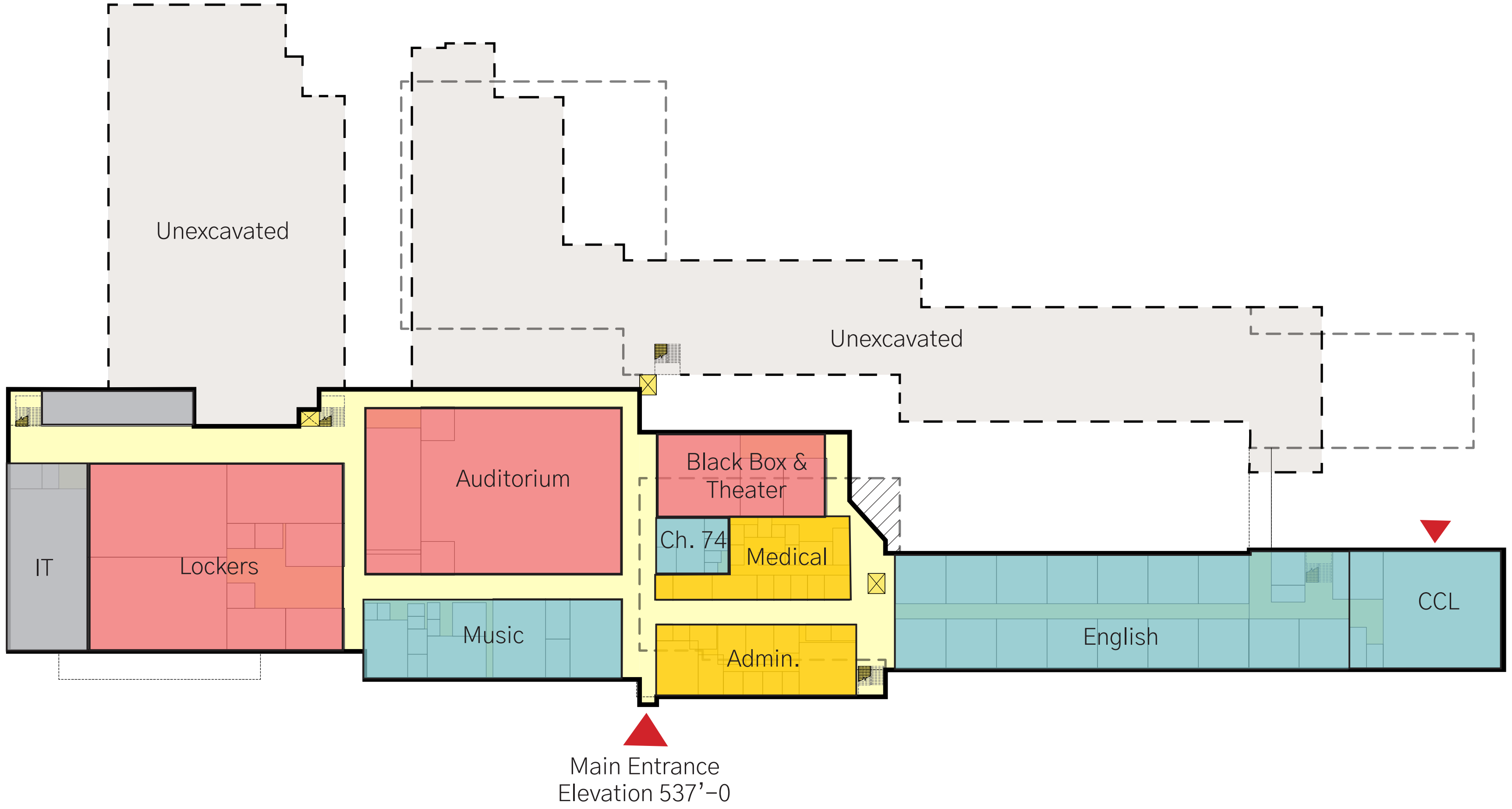


LEGEND:

- ▨ Parcel Property Line
- ▨ Potential acquisition
- 🟥 New Construction
- 🟩 New Athletic Field
- ☐ Existing Building to be demolished
- ▨ Existing Building to be renovated
- ━ Retaining Wall
- ▨ Steep Topography
- ▲ Entrance
- ▬ New Roadway
- ➡ Bus Circulation
- • • ➤ Parent Circulation
- ➡ Connection
- ▬ Utility

N

0' 50' 100' 200'



FIRST FLOOR

1"=100'

LEGEND

🟥 CORE FACILITY

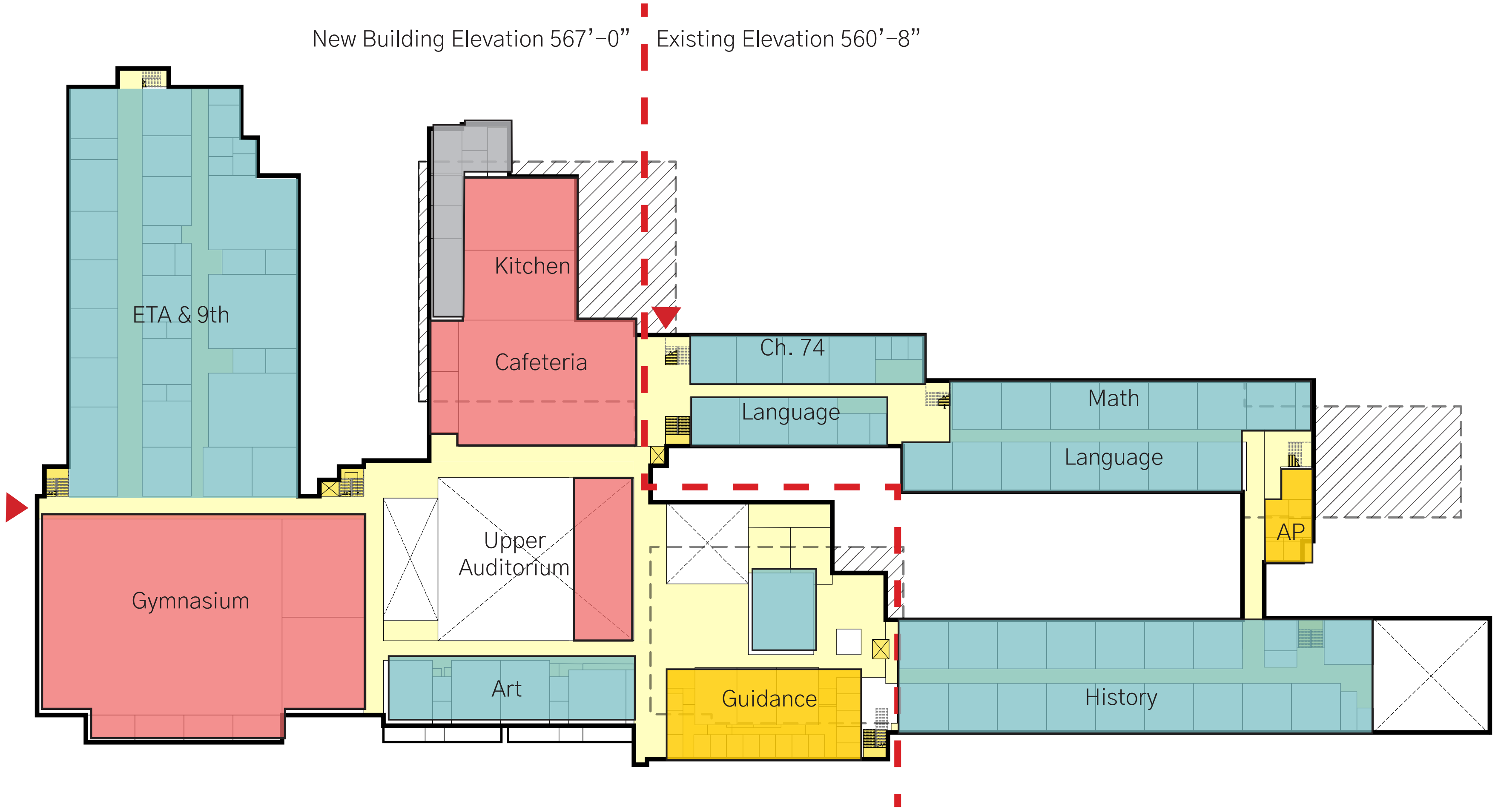
🟦 ACADEMIC

🟨 ADMINISTRATION

⬜ BUILDING SERVICE

⬜ CIRCULATION

N

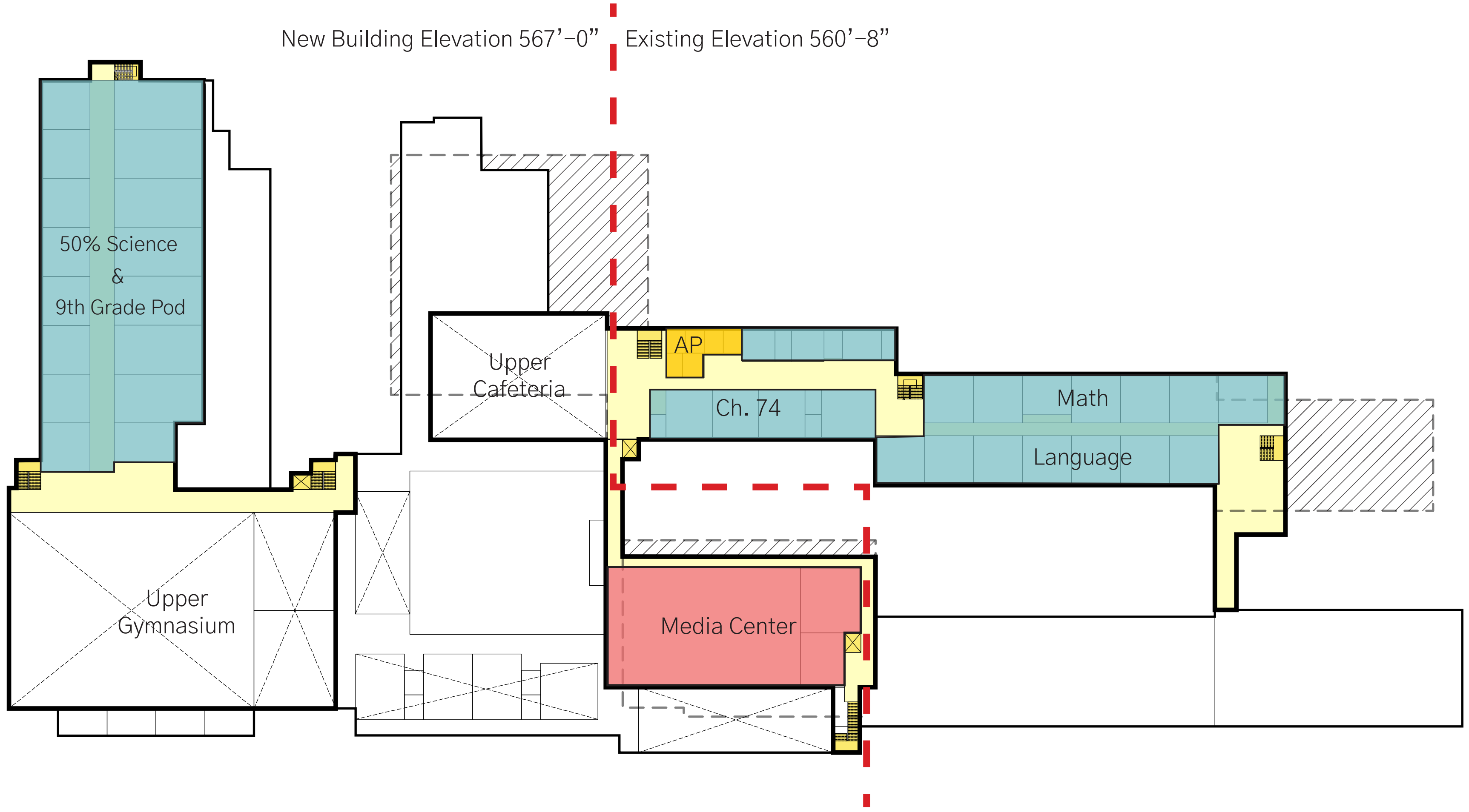


SECOND FLOOR

1”=100’

LEGEND
- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ◼ BUILDING SERVICE
- ◻ CIRCULATION

N



THIRD FLOOR

1"=100'

LEGEND
- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N

FOURTH FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY

🟦 ACADEMIC

🟨 ADMINISTRATION

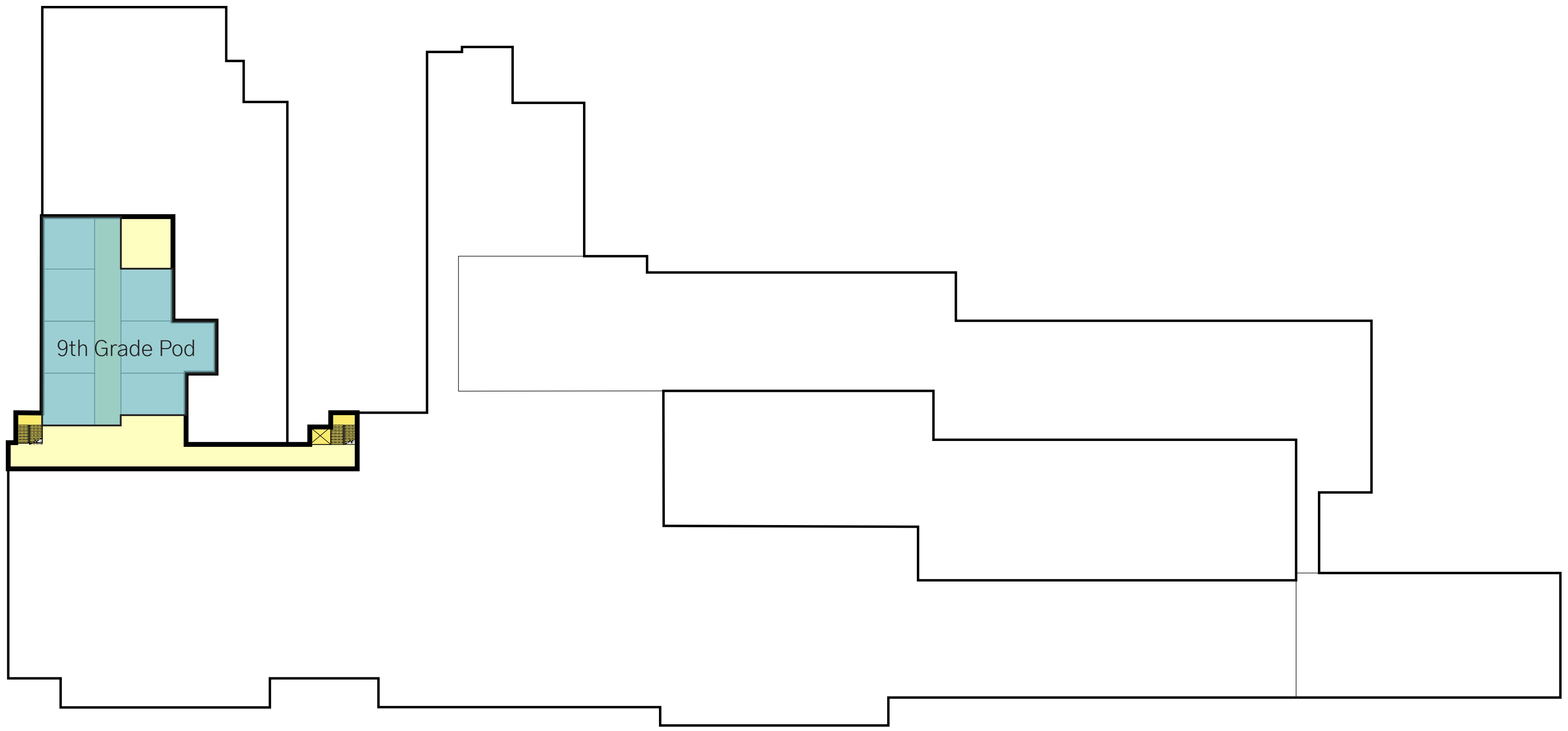
⬛ BUILDING SERVICE

⬜ CIRCULATION

N

Doherty Memorial High School
299 Highland Street, Worcester MA

LPA|A



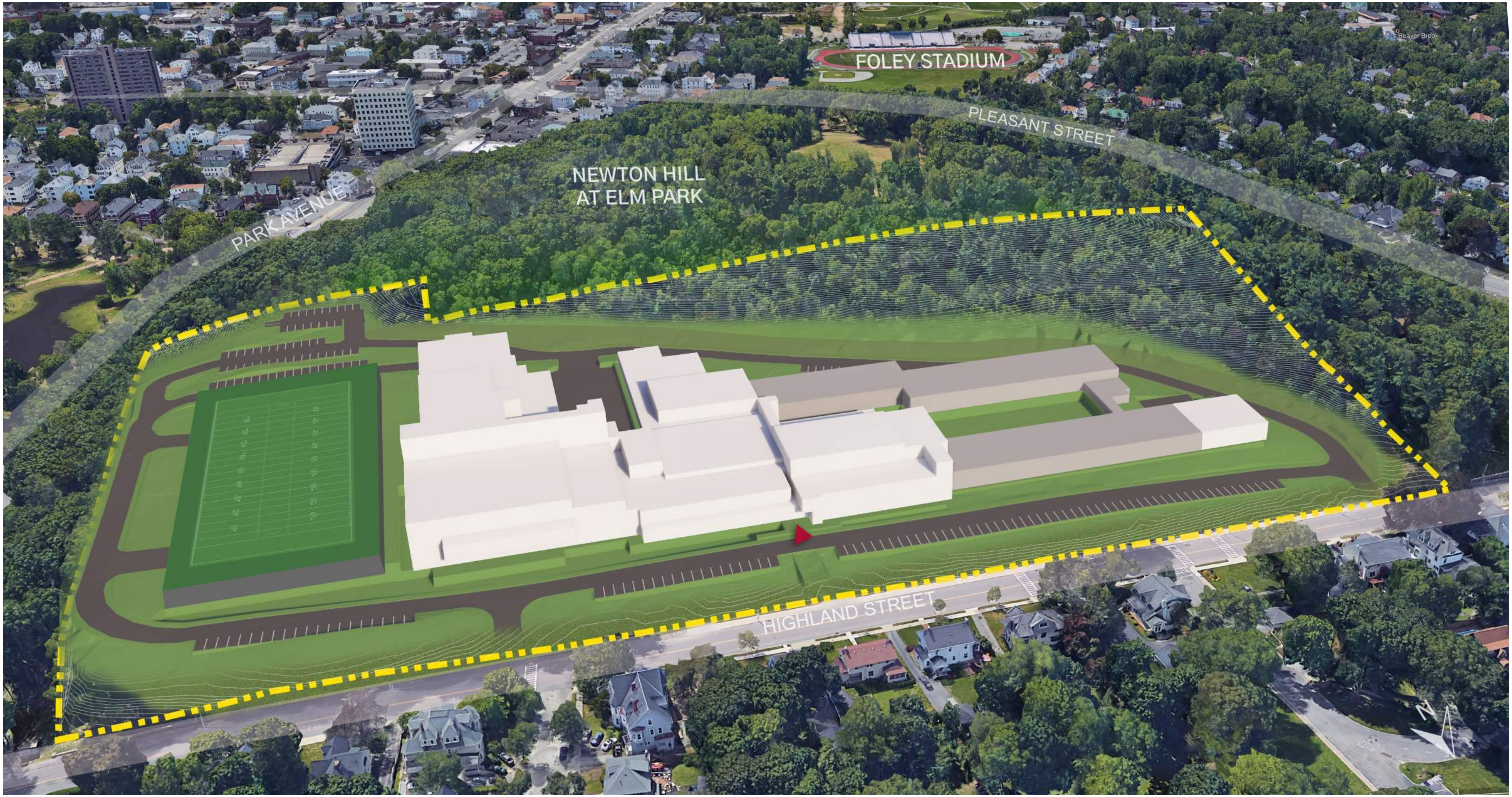
FIFTH FLOOR

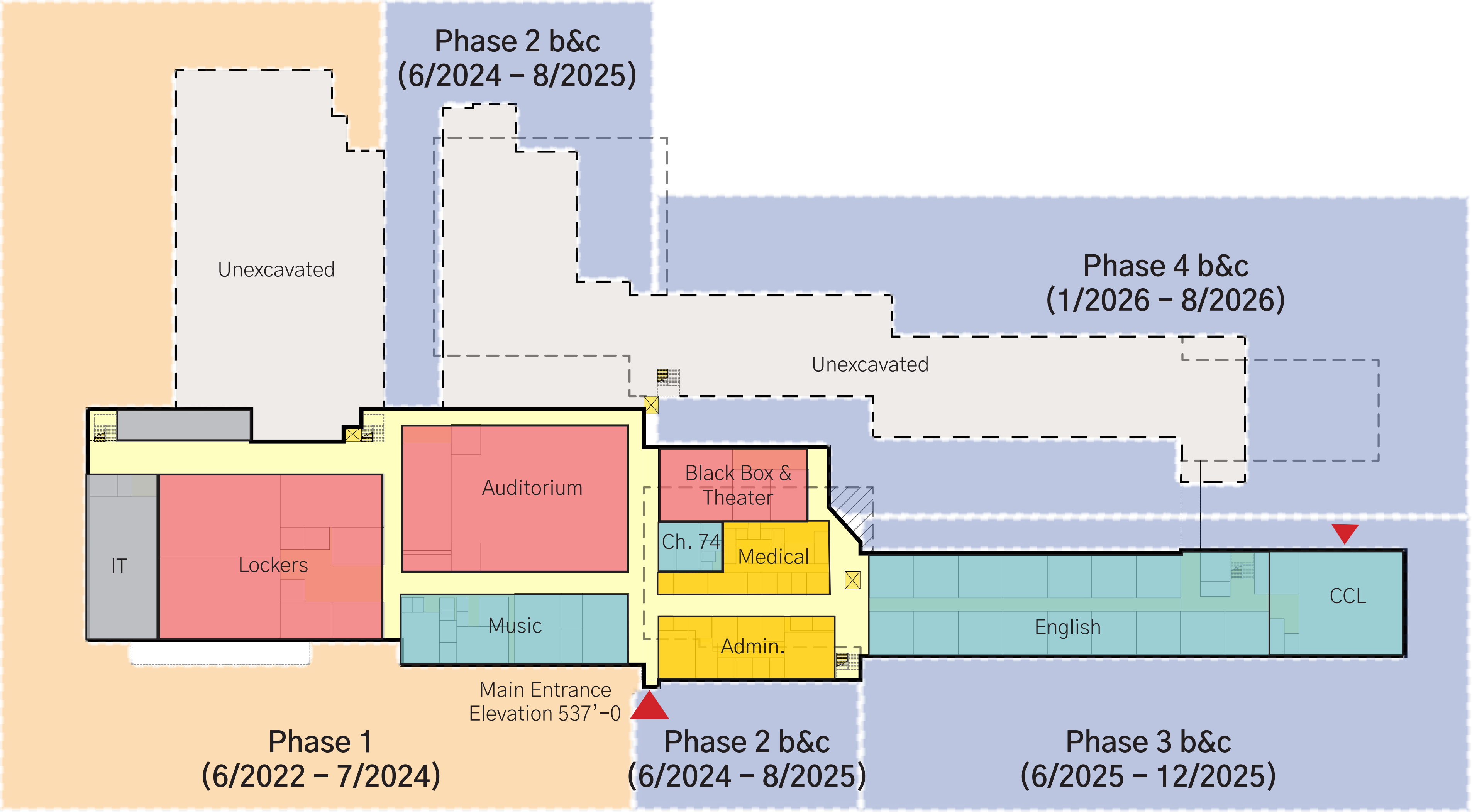
1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬛ BUILDING SERVICE
- ⬜ CIRCULATION

N


FOLEY STADIUM
PLEASANT STREET
NEWTON HILL AT ELM PARK
PARK AVENUE
HIGHLAND STREET
Beaver Brook
N



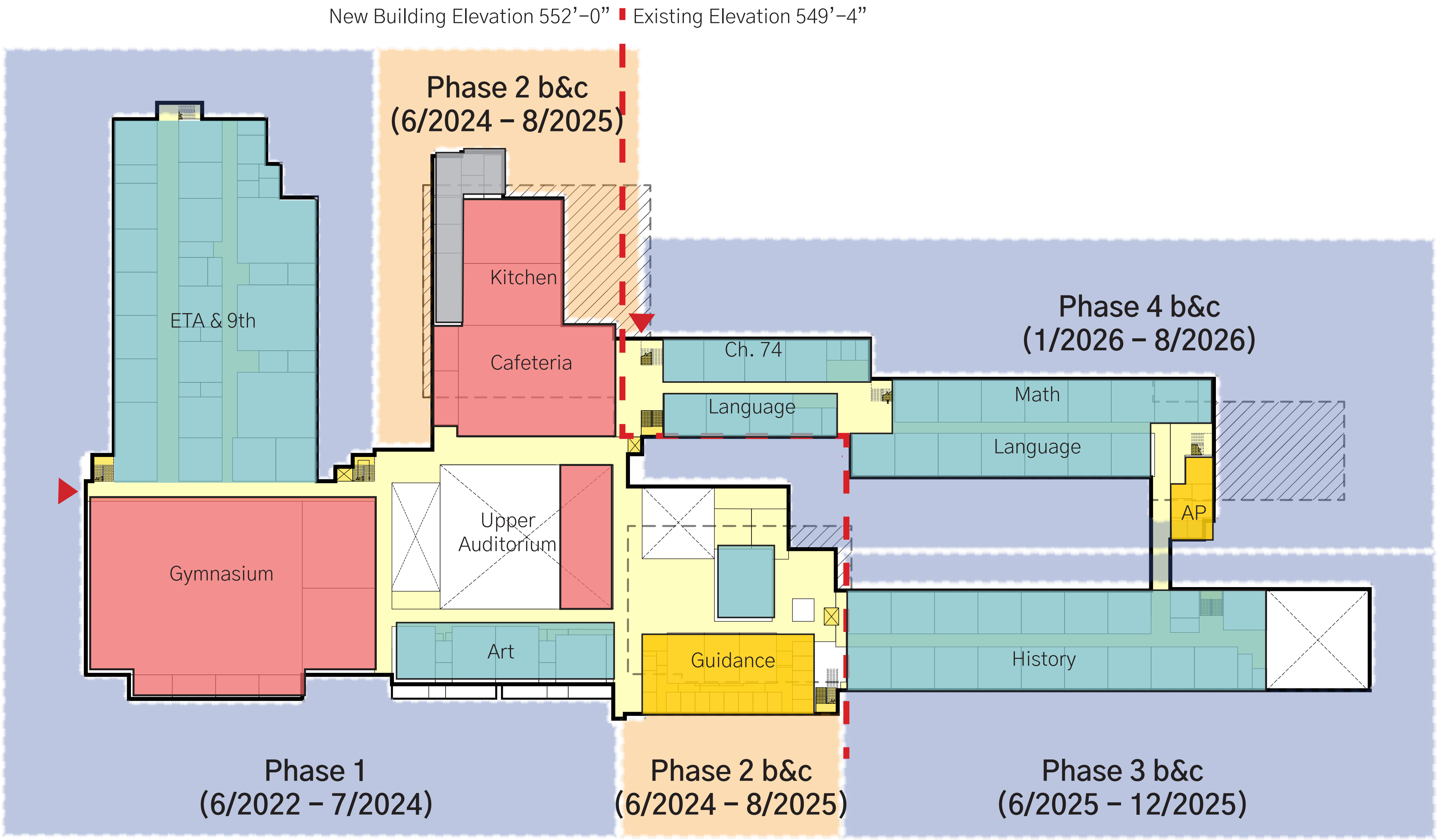
First Floor (To match existing Floor level, Elev 537'-0")

FIRST FLOOR

1"=100'

LEGEND
- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ▨ BUILDING SERVICE
- ⬜ CIRCULATION
- 🟪 CM WORK AREA
- 🟧 OWNER OCCUPIED AREA

N



Second Floor, Elev 552’-0” (will not match existing 2nd floor)

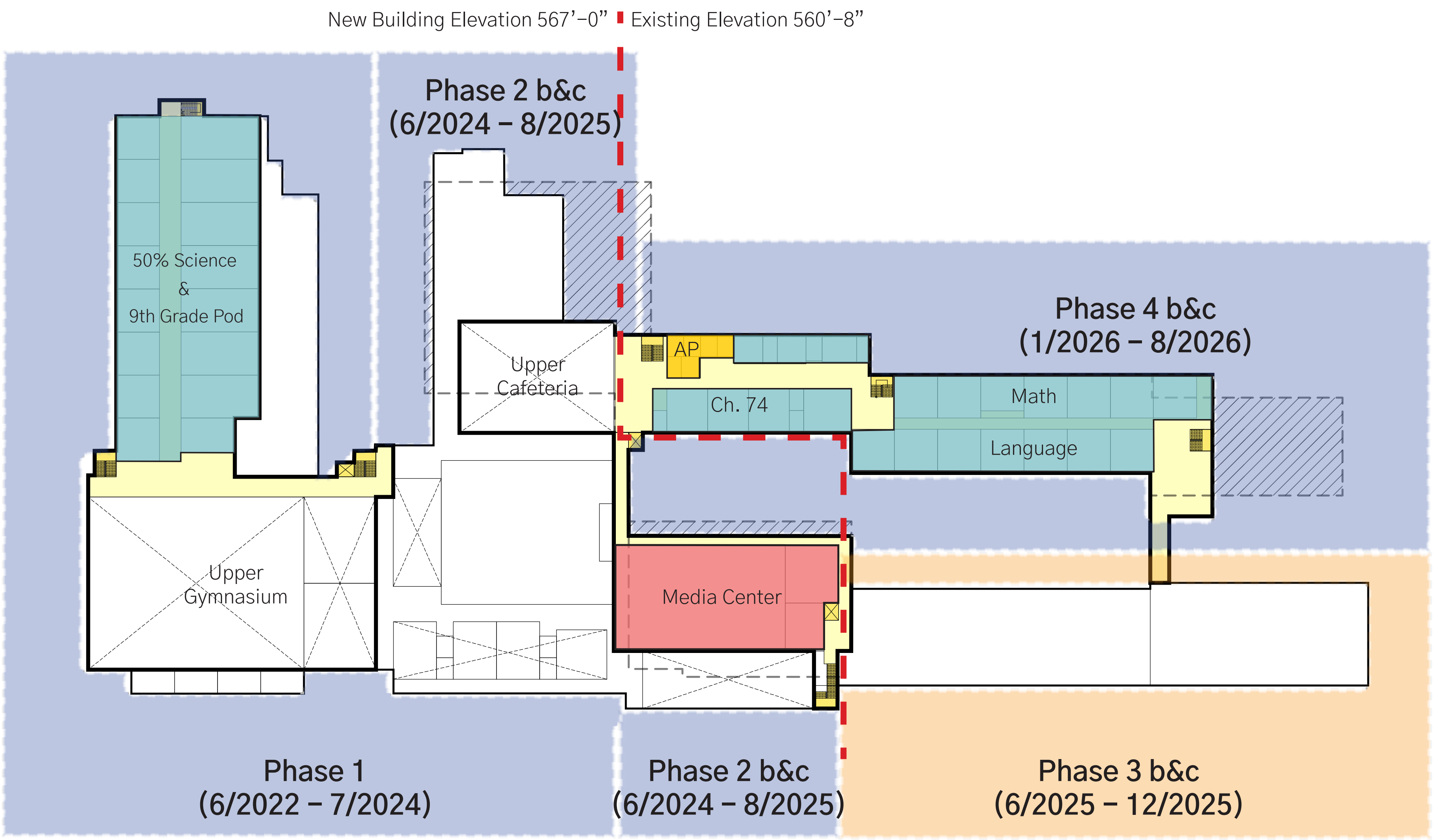
SECOND FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬛ BUILDING SERVICE
- 🟨 CIRCULATION
- 🟪 CM WORK AREA
- 🟧 OWNER OCCUPIED AREA

N



Third Floor, Elev 567'–0" (will not match existing 3rd floor)

THIRD FLOOR

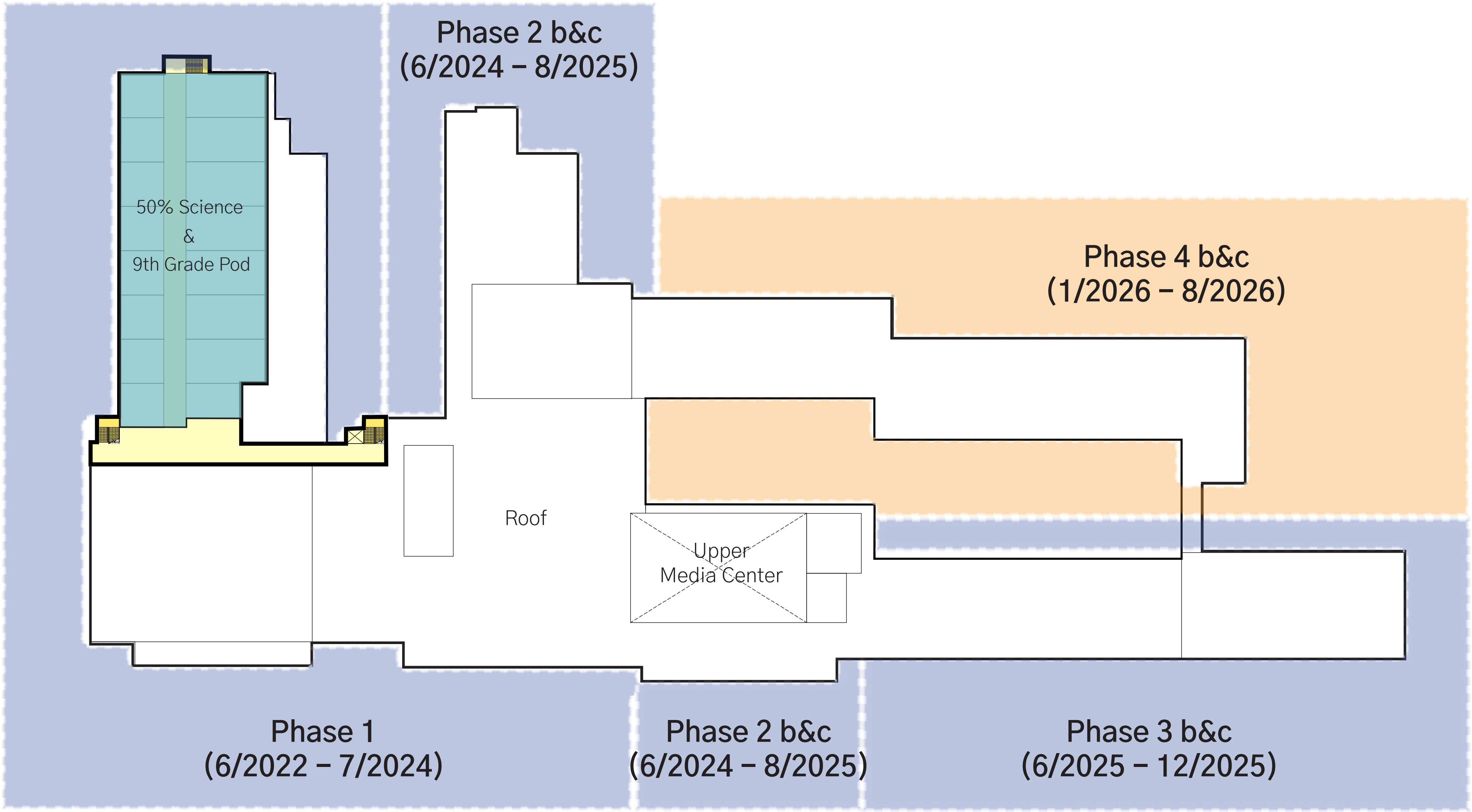
1"=100'

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- 🟨 CIRCULATION
- 🟪 CM WORK AREA
- 🟧 OWNER OCCUPIED AREA

N

FEASIBILITY STUDY



Fourth Floor, Elev 582’–0”

FOURTH FLOOR

1”=100’

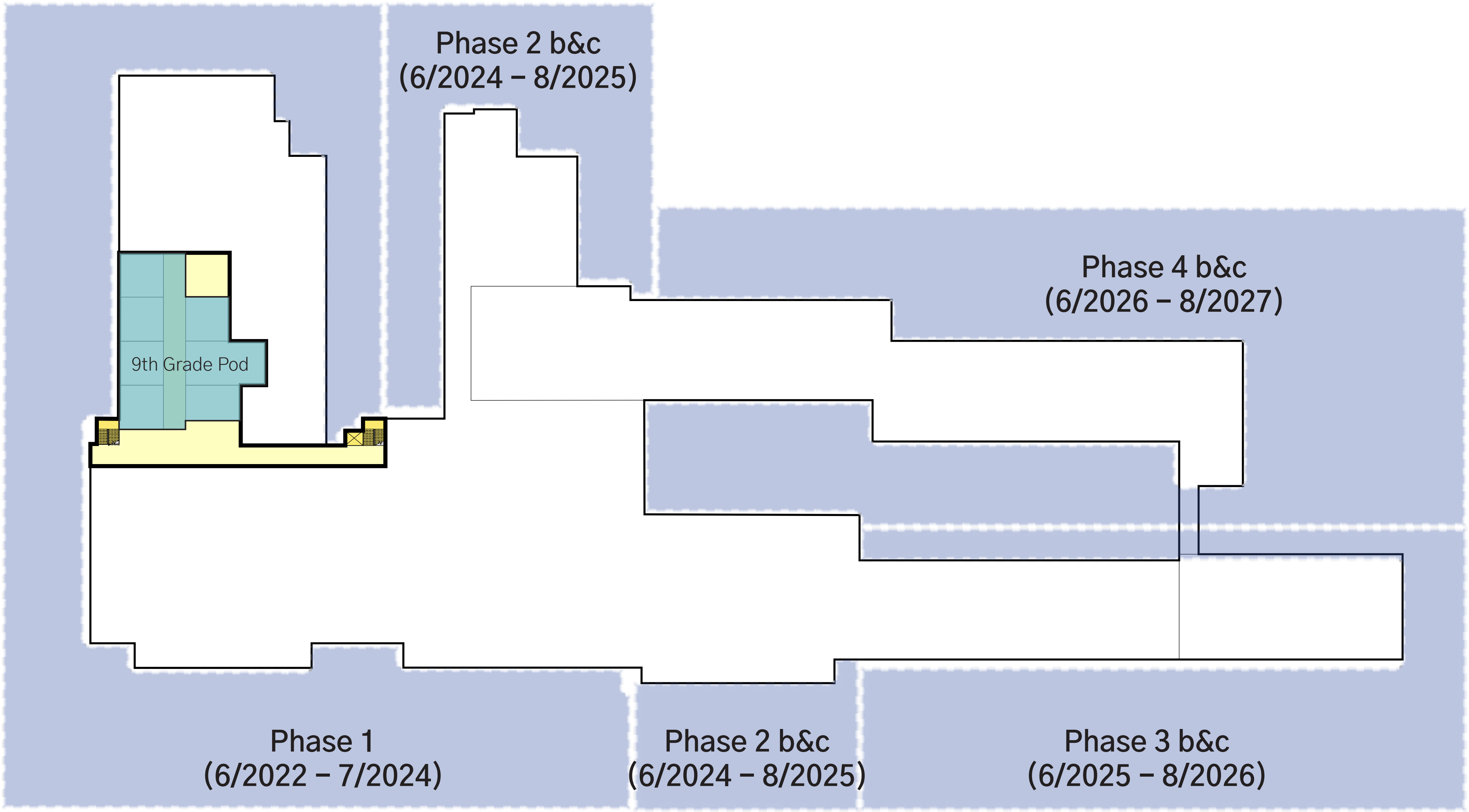
LEGEND

- ▨ CORE FACILITY
- ▨ ACADEMIC
- ▨ ADMINISTRATION
- ▨ BUILDING SERVICE
- ▨ CIRCULATION
- ▨ CM WORK AREA
- ▨ OWNER OCCUPIED AREA

N

Doherty Memorial High School
299 Highland Street, Worcester MA

LPA|A



Fifth Floor, 597’–0”

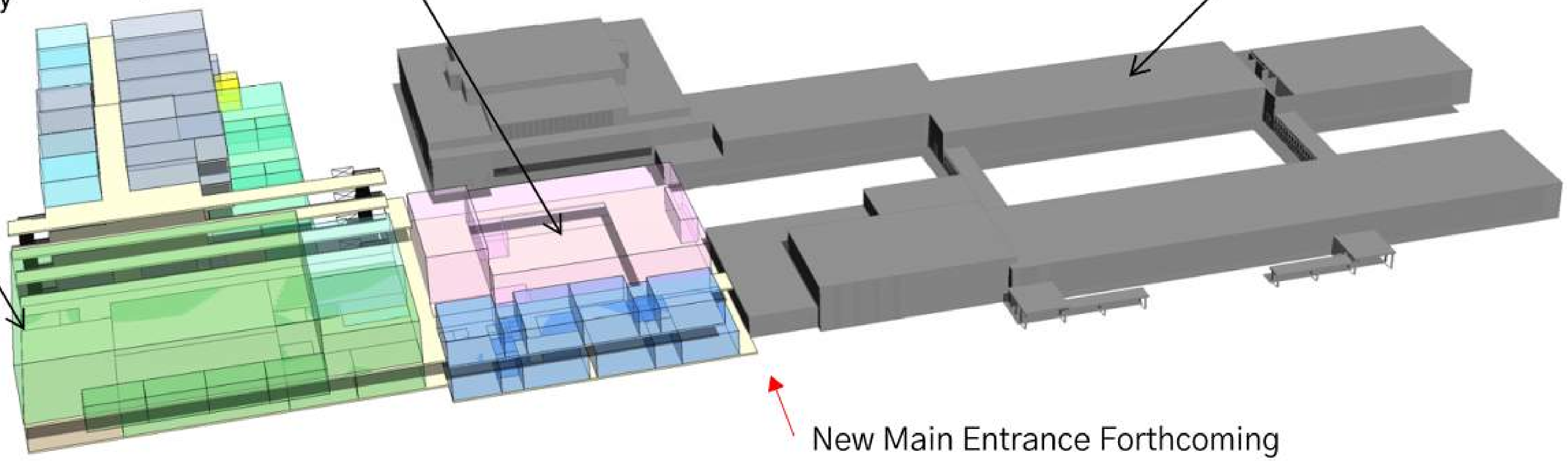
FIFTH FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟩 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- 🟨 CIRCULATION
- 🟦 CM WORK AREA
- 🟧 OWNER OCCUPIED AREA

N



Performing Arts Wing
Music Spaces (Floor 1)
Art Spaces (Floor 2)
*Black Box Theater in Phase 2

Science and 9th Grade Wing
9th Grade Pods (Floors 2, 3, 4)
Science Classrooms / Labs (Floors 2, 3)
E.T.A. (Engineering Technology Academy (Floor 1)
*Includes +20 classrooms for swing space, temp.
modulars would increase swing space capacity

Physical Education (Gym) Wing
Gym (Floor 2)
PE Secondary Spaces (Floor 1)
IT Mechanical Spaces

Existing School
No work this phase

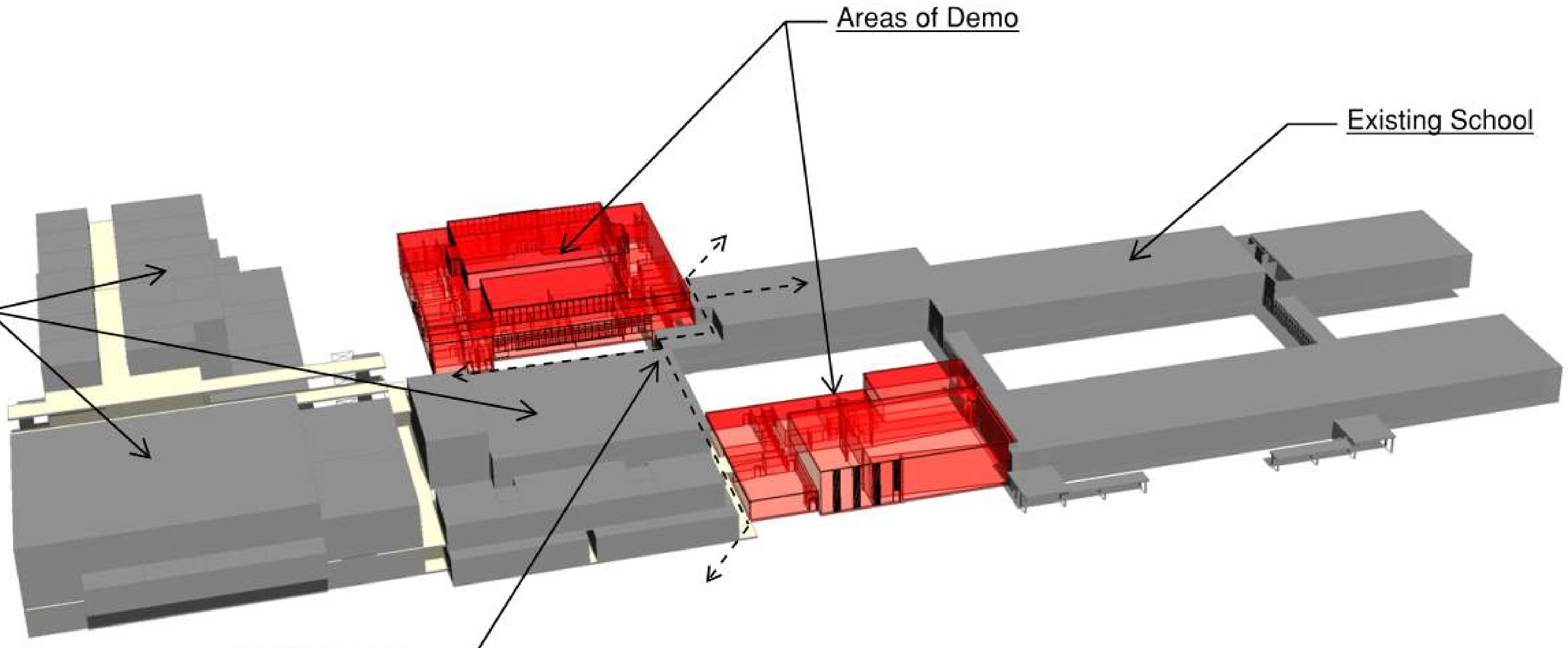
New Main Entrance Forthcoming

Phase 1

(6/2022 – 7/2024)

Phase Goals:

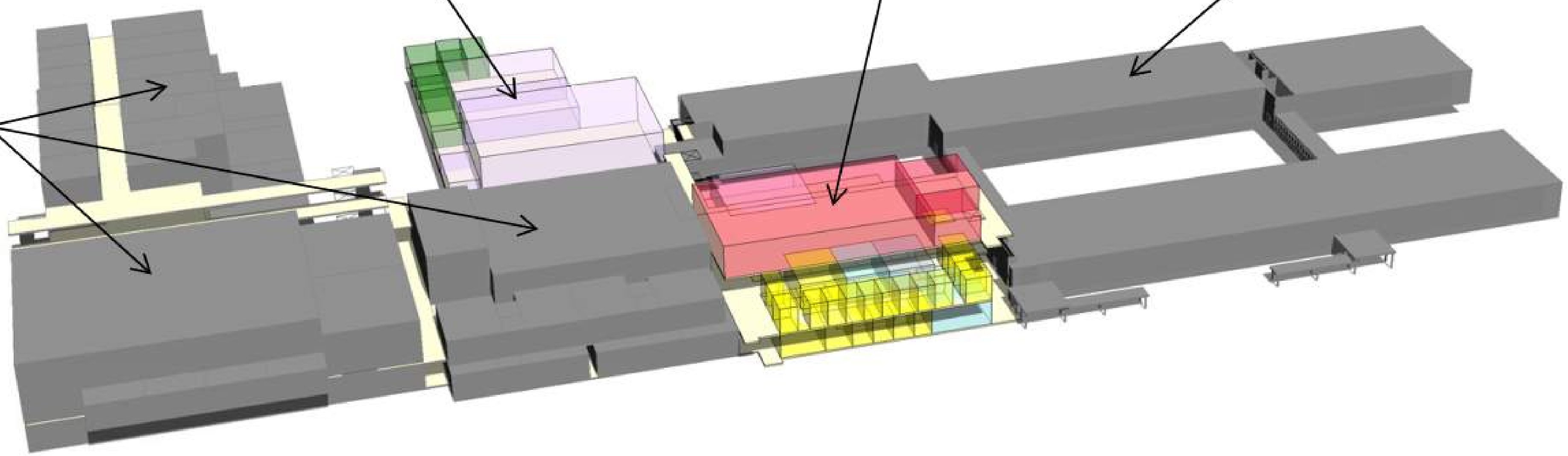
- Leave existing building & program use undisturbed
- Building Addition to contain classroom swing space to draw down existing facility use.
- Replace Physical Education, Performing Arts and E.T.A. educational programs in entirety with the intent to demolish existing spaces



Phase 2b: Demo

(6/2024 – 9/2024)

Phase Goals:
– Demolish obsolete spaces, prepare for additions/renovation



Admin Core & Media Center
Main Admin Suite, Medical Suite (Floor 1)
Black Box Theater (Floor 1)
Performing Arts Maker Space, Set Storage (Floor 1)
Large Group Seminar (Floor 2)
Guidance Suite (Floor 2)
Media Center Suite (Floor 3)

Food Services & Recieving

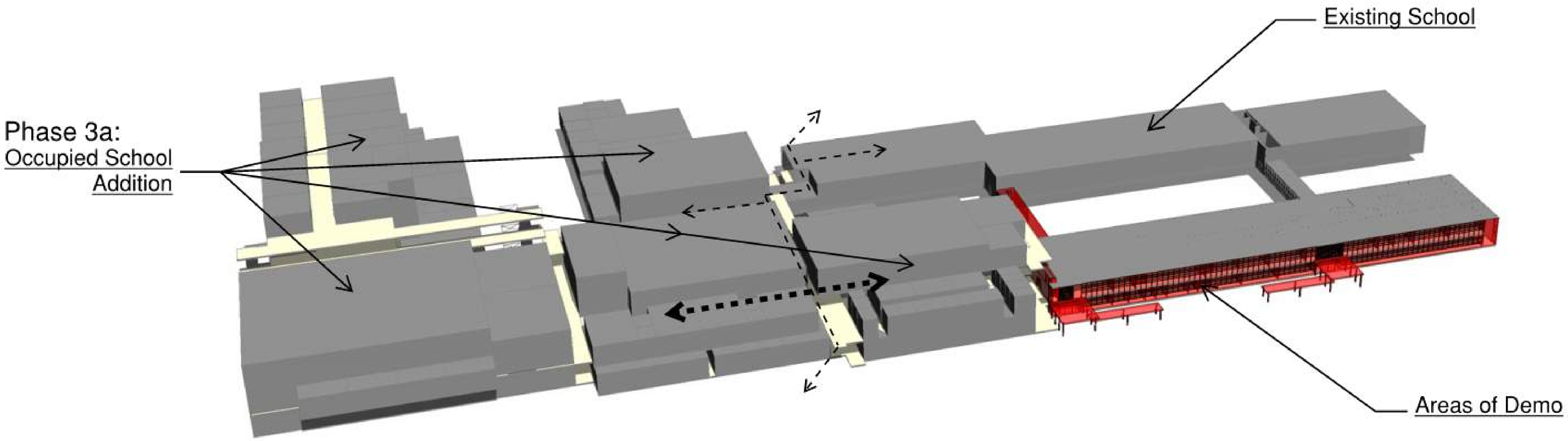
Existing School

Occupied School Addition

Phase 2c: Renovation & Addition

(9/2024 – 8/2025)

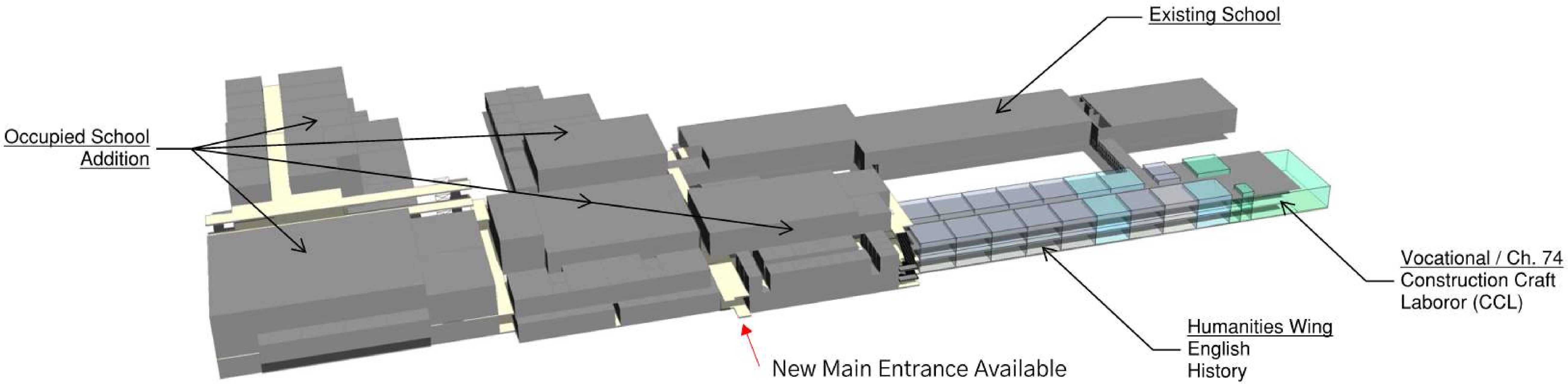
Phase Goals:
– Construction spaces as outlined above



Phase 3b: Demo

(6/2025 – 8/2025)

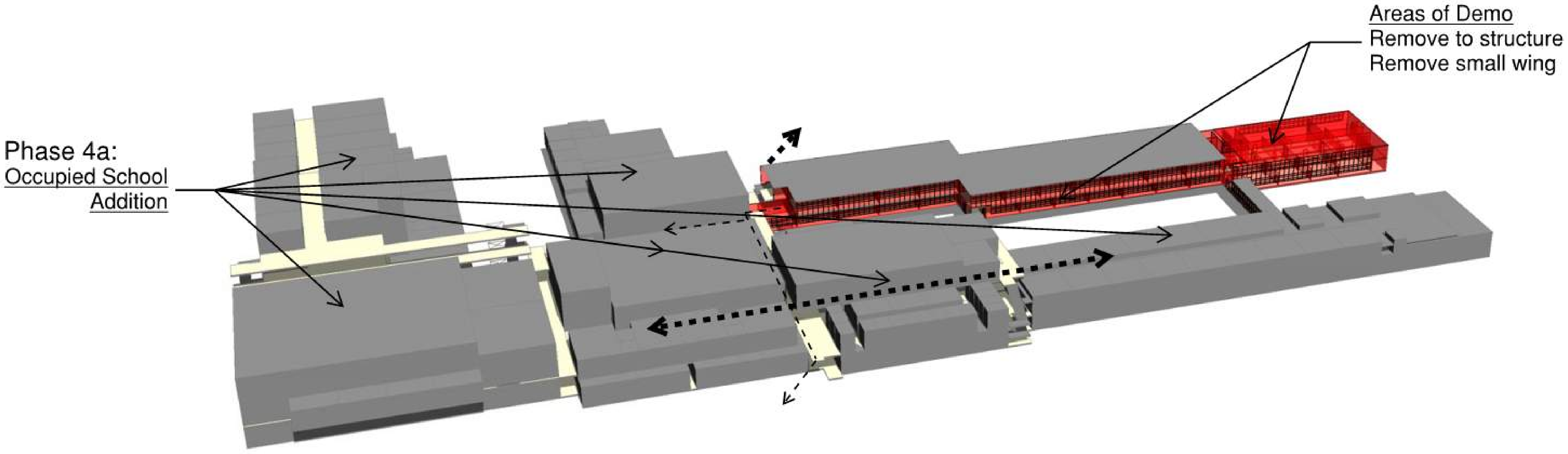
Phase Goals:
– Demolish obsolete areas, prepare for additions/renovation



Phase 3c: Additions & Renovation

(8/2025 – 12/2025)

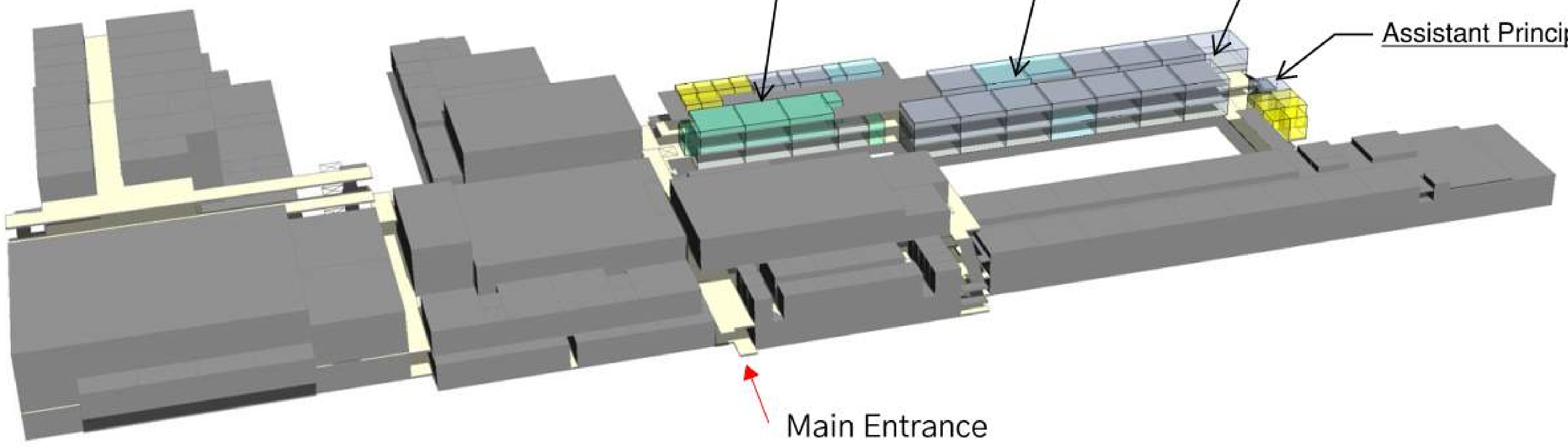
Phase Goals:
– Renovate general classroom wing for English and History departments as well as Construction Craft Laboror Classrooms and shop.



Phase 4b: Demo

(1/2026 – 4/2026)

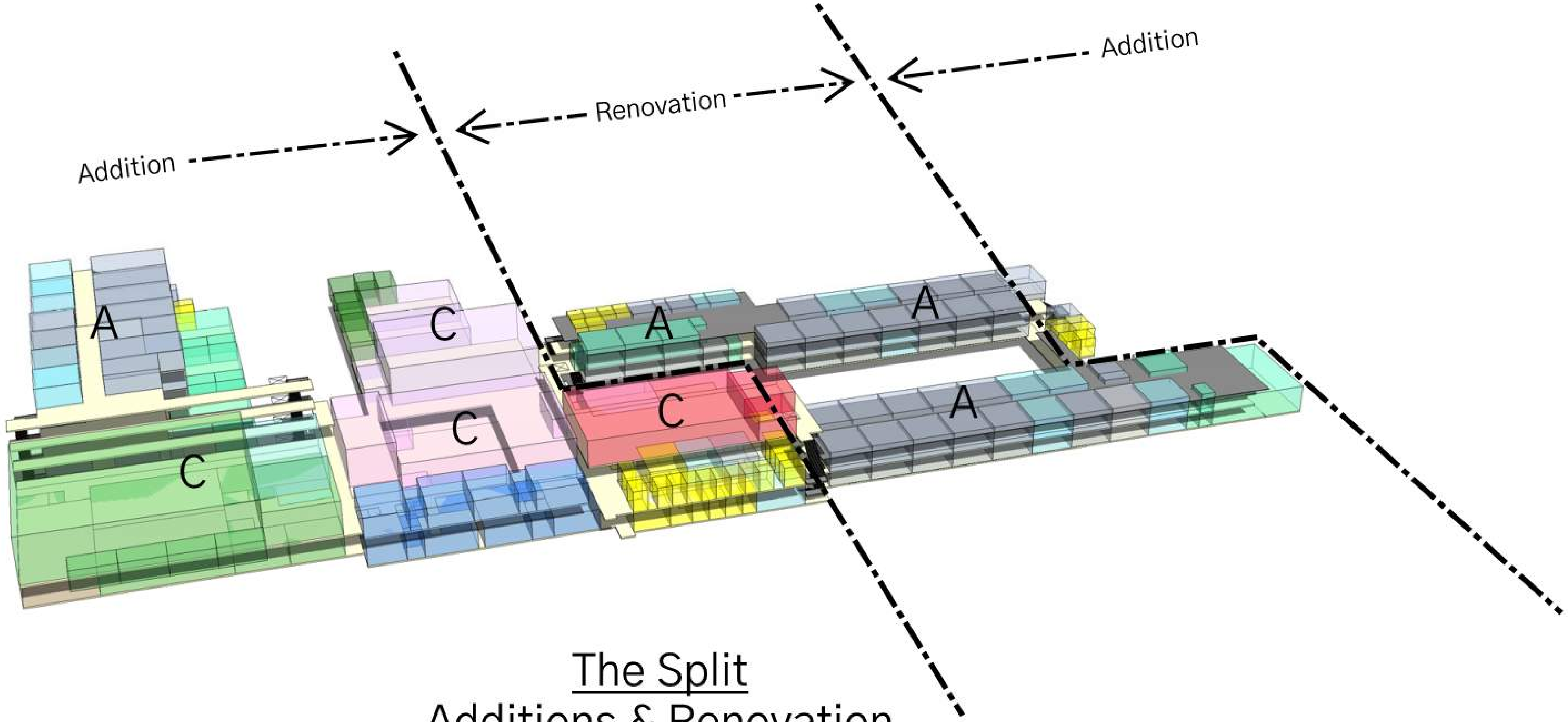
Phase Goals:
– Demolish obsolete areas, prepare for additions/renovation



Phase 4c: Additions & Renovation

(4/2026 – 8/2026)

Phase Goals:
– Renovate general classroom wing for Math and Language departments as well as the balance of Vocational spaces.



A = Academic Spaces
C = Community/Core Spaces

The Split
Additions & Renovation
(respectively)

3.3.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options

3. Option A.1 New Construction on Existing Site: Pods on Park

a. Narrative
b. Site Plan
c. Floor Plans
d. Section
e. Massing
f. Phasing Plans

3. Option A.1 New Construction on Existing Site: PODS ON PARK

a. Narrative

SUMMARY: The New Construction Option is based on a new building located on the adjacent field area east of the existing building, and assumes that the new building will be constructed while the existing building remains fully occupied. Once the new building is complete, the existing building would be demolished in its entirety and the athletic fields, parking, driveways, etc. would be completed. While there will be **temporary** construction impacts with this option, most notably the loss of nearly all existing outdoor areas and student parking capacity in part, they are primarily site-related and the end result is a solution that meets most if not all of the Educational Program requirements. However, given the limited acreage of developable site, the sports fields site program will not be met.

PARTI DIAGRAM:

BUILDING ORGANIZATION:

Option A.1 Pods on Park is organized with a central circulation spine with academic pods to the west and core academic areas to the east. The building is organized into a total of 6 levels that step up the site's steep topography. This configuration provides grade access to the main entrance, the Gymnasium, the receiving area and the ETA Suite, while also ensuring that no portion of the building is greater than four stories in height. The academic pods are flexible to allow Academic departments to be organized on two floors vertically (with opportunities for vertical common rooms) or in two adjacent pods on the same floor. Given this organization, access control between community and academic would occur at the pod entrances. The pod configuration provides the greatest opportunities for daylight to each classroom, and takes advantage of the prominent views toward the City center and Elm Park. A strong circulation spine provides clarity of circulation and organization, ending at the stacked 9th grade common rooms facing towards Highland Street, creating an opportunity for visual emphasis. The massing along Highland Street would therefore be varied, featuring an academic wing, as well as Art and Music classrooms and community-use spaces.

3. Option A.1 New Construction on Existing Site: PODS ON PARK

a. Narrative

SITE CONFIGURATION:

The proposed site circulation for Option A.1 provides two separate loops for bus and parent drop/off and pickup traffic. The PDP submission site plans and cost estimate for the New Construction on Existing Site option included a parking deck below an elevated football field. Option A.1 was refined to include a parking garage with approximately 100 staff parking spaces beneath one section of the building, with vehicular access from the east side. Relocating the parking garage below the building was found to be more cost effective, more efficient and more aesthetically pleasing as the football field could then be built on grade level. The parking garage is located conveniently on the first level with direct access to the main lobby. The site also includes a new turf football/soccer/field hockey field construction on grade, with lighting bleachers and a separate toilet /storage building. This site scheme creates an opportunity to enhance the central main entrance with a large entrance plaza and central pedestrian pathway to the field. Lastly, this option will allow for a clear north-south construction separation fence, allowing the school's existing staff parking lot to remain functional throughout construction. Refer to the Civil and Traffic Basis of Design narratives in section 3.3.3.D.1 for additional analysis.

OPTION ANALYSIS:

Proposed SF areas for this option are approximately as follows:

New Construction	**= 420,000 GSF**
Demolition (existing building)	**= 167,000 GSF**

ABILITY TO MEET BUILDING PROGRAM:

This New Construction Option satisfies most if not all Educational Program/Space Summary objectives. Compared to the other options on the Doherty Site, this option provides the greatest opportunities for views and daylighting in the classrooms. The building layout features clear and understandable pod organization off of a two-story lobby/entrance. The gymnasium is located one level above the main entrance as the last building section tiers step up Newton Hill. If selected as the preferred solution, the design team will review potential architectural solutions for linking these two levels. The design team will also review opportunities to optimize the floor plan overall organization, interior to exterior connections, and interface with the site and site features including the under-building parking.

ACQUISITION ISSUES:

3. Option A.1 New Construction on Existing Site: PODS ON PARK

a. Narrative

The Site is bounded by park land; there are no expansion options or acquisition issues. The Doherty sports programs utilize Foley Stadium for many practices and games. Improved access to Foley would be beneficial.

COMPARATIVE STAFF AND STUDENT IMPACT:

It is assumed that the work will begin with construction of a new building, including associated sitework infrastructure, to be located on the field area east of the existing building. We anticipate that the entire practice football field, and the student/Newton Hill visitor parking lot, will be consumed by the building and the Contractor for staging material laydown/storage, worker/equipment parking areas and temporary office trailers. During this time the existing building would remain fully occupied and functional, at least internally, much like it does presently. Externally, construction access would impact vehicular traffic and parking patterns with the additional loss of the on-site PE/Athletic practice fields. We expect that the Contractor will access the site via the driveway and parking area to the side of the existing building, however, construction access may also have a construction only access road at the east side. Similar to the Code Upgrade and Renovation/Addition Options, the summer break will be leveraged to maximize productivity for work (i.e. sitework such as repaving, new site utilities, drainage infrastructure, etc.) that would normally disturb school vehicular/pedestrian traffic.

Because a new building can be constructed entirely outside the footprint of the existing building (which can remain fully occupied), the New Construction Option will have less impact to students than the Code Upgrade or Renovation/Addition Options, all without the need for “swing space”. As previously noted, the biggest temporary construction impacts are site-related and include the following:

- Loss of PE/Athletic fields and other outdoor spaces during construction.
- Loss of student parking.
- Relocation of pedestrian/vehicular traffic and staff/faculty parking from a reconfigured site layout, designated parking areas, and a dedicated construction access-way.

One advantage of New Construction is that it doesn’t have the same limitations, in terms of work area, as either the Code Upgrade or Renovation/Addition Options. More workers can be productive because there is a greater area to work in. Consequently, the duration of the project can be less than an occupied project which has numerous phases with complex scope of work, relocations, and temporary support facilities. Like the other options, the New Construction Option will leverage summer breaks to maximize productivity, particularly site-related, and reduce construction impacts.

ABILITY TO MEET SITE ATHLETICS PROGRAM

3. Option A.1 New Construction on Existing Site: PODS ON PARK

a. Narrative

While the program ideally would have all the desired fields on the same site, limited field development is anticipated. The proposed site plan shows a football/soccer/practice field with bleachers and an outdoor toilet building. The off-site fields at Foley Stadium will still be beneficial to supplement the athletic program.

CENTRAL TO DISTRICT/QUADRANT:

The existing school site is recognized as central to the Doherty Quadrant.

SITE DEVELOPMENT COSTS:

The Soils test from the original construction and record information indicate heavy glacial till and assumed ledge or boulders. Short to moderate height retaining walls are anticipated to optimize site area available. Conceptual designs include moderate soils cutting at existing the sports field and parking garage. To better meet the site program, an underground parking garage is proposed beneath the building.

TRAFFIC IMPACTS & ACCESS:

The existing Doherty site is limited to access from Highland Street only, which has limitations, and is subject to traffic congestion. Refer to Section 3.3.3.D.1 for an updated traffic analysis.

BUS & PARENT VEHICULAR CIRCULATION & PARKING:

This option creates separate loops for bus and parent circulation, but all access is from Highland Street, adding to traffic flow complexities. In order to achieve the required parking on site, a below grade parking garage on a portion of the first is carried within the cost estimate. The proposed the parking garage would accommodate approximately 100 parking spaces, which would be for staff vehicles only. The underground parking represents a moderate cost, but is located next to the main floor lobby for improved access and visibility. Perimeter access around the building for emergency vehicles is provided per requirements.

CONSTRUCTION SCHEDULE IMPACT:

With the phased construction, the building is anticipated to meet the current occupancy goal of Fall 2024, however the fields will not be completed and available for use until the following year. Early bid packages are anticipated as follows:

- Design Development Submission and Site Enabling Bid Package
- 60% Construction Document Submission and Early Site Work Bid Package
- 90% Construction Document Submission and Early Concrete and Steel Bid Package

The conceptual project phasing at the time of this report is as follows:

ENABLING SITEWORK PACKAGE (06/2021 to 9/2021):

- Mobilize on site; Install temporary retaining walls at Highland Street, excavation and slope mitigation at the rear of the school. Regrade and install paving around the building create fenced dedicated construction access driveway to the east of the existing building; prepare northernmost lower parking area as CM/Subcontractor area for temporary facilities, storage, parking, etc.

PHASE 1 (10/2018 to 6/2024):

- Mobilize on site; create fenced dedicated construction access driveway around west of the existing building; prepare northernmost lower parking lot as CM/Subcontractor area for temporary facilities, storage, parking, etc.
- Perform early sitework scope including site prep for new building, new utilities, construction access to lower parking lot, new terraced parking lots and perimeter driveway (Early bid packages are anticipated for Site Work, Concrete and Steel.)
- Construct new building

PHASE 2 (6/2024 to 9/2024):

- Abate hazardous materials and demolish existing part of existing school, beginning with the areas closest to the new building (Gymnasium, ETA, Music, Auditorium and Classrooms)
- Perform sitework scope including new staff parking and driveways at main entry
- Receive and install FF&E
- Occupy existing building for the 2024 school year.

PHASE 3 (9/2024 to 5/2025):

- Perform remaining sitework scope including new synthetic field, bleachers and outdoor toilet building, finish paving, landscaping and other site improvements
- Demobilize

ADJACENT USES & NEIGHBORHOOD IMPACT:

The existing school is an established location, so impact on the neighborhood is expected to be limited primarily to construction related activities, with a minor increase of traffic due to the added enrollment. The southern portion of the site that is currently undeveloped is used by the Newton Hill parks programs, disc golf, trails, and buffer land with no significant disruptions anticipated. Discussions have been held to consider mutually beneficial opportunities to link the school property and the park. Possible solutions discussed include improvement of trails on Newton Hill, provision of parking spaces for access to the park after hours, green retaining walls and other facility improvements.

Historical Elm park is also across Park Avenue to the east, which represents opportunities for views and visual connections.

UTILITIES & DEVELOPMENT ISSUES:
Utilities are available and adequate. Refer to the Civil Basis of Design narrative in Section 3.3.3.D.1.

ADDITIONAL CITY COSTS (NOT ELIGIBLE FOR MSBA REIMBURSEMENT):
LPA|A reviewed opportunities to supplement Doherty's athletic fields, both during construction and after completion. One option for expansion is the addition of a rectangular football/soccer/field hockey field at the existing nearby Duffy Softball Field. Other City offsite scope may include improvements for traffic management and pedestrian crosswalks.

Additional considerations include:

- Temporary Off-Site parking through construction
- Newton Hill trail improvements
- Improved Access to Foley Field (land cost of rear land of three Abbott Street parcels)
    - Development of added land with new basketball or tennis courts and Surface Parking
- Beaver Brook practice field improvements (underdrains)
- Foley Stadium Improvements to Rear Fields

The total added city costs for this Option would range between $6-11 Million. Refer to Section 3.3.3.D.3 Offsite improvements for more information.

NEW CONSTRUCTION SCOPE OF WORK:

Site:

Provide full site accessibility to comply with 521 CMR including:

- Provide an accessible route, via new sidewalks ramps, and curb cuts, from Highland Street
- Refer to Civil and Traffic Basis of Design narratives in Section 3.3.3.D.1.

Building Exterior/Interior:

- Refer to the Architectural Basis of Design Narrative in Section 3.3.3.D.1.

Sustainability / Net Zero Energy Goal:

- Provide infrastructure required for sustainable building project, and net zero energy goals
- The City / School Facilities departments have developed a list of preferred systems and equipment choices that are maintainable, durable and efficient, and updates their list with newer equipment as systems come on the market.
- A design charrette will be scheduled early in the design process to solicit input and priorities in an effort to determine the best strategies for this project. The Sustainable Design consultant and MEP consultants will attend and present new energy saving strategies for consideration.
- One approach used in the past that would be continued on this project are to maximize the R value of the building envelope, including components such as windows and doors.
- Refer to the MEP narratives for additional information.

Fixtures, Furnishings & Equipment (FF&E)/Technology:

- Provide new FF&E throughout including furnishings, equipment, maintenance items, etc.
- Provide new Technology throughout including student/teacher computers, mobile device charging carts, interactive projectors, servers, etc.

Hazardous Materials:

- Abate entire existing building prior to demolition
- Provide radon mitigation system at Lower Level slab-on-grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:

- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

Food Services:

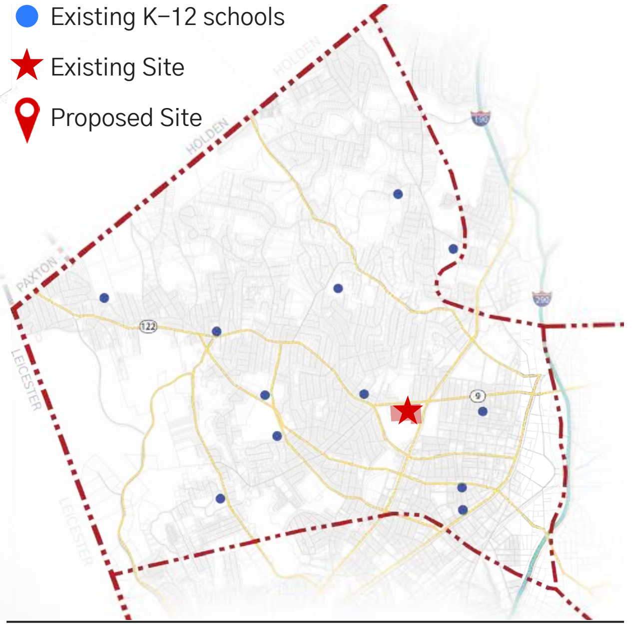
- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.

Option A.1 New Construction on Doherty Site
EXISTING SITE

NOTES:

- Surrounded by Newton Hill Park
- Steep topography to the South
- Access only from Highland Street

QUADRANT KEY PLAN:



● Existing K–12 schools

★ Existing Site

📍 Proposed Site

LEGEND:

Parcel Property Line

Potential acquisition

🟥 New Construction

🟩 New Athletic Field

Existing Building

Flood Plain

Wetland

Retaining Wall

Steep Topography

▲ Entrance

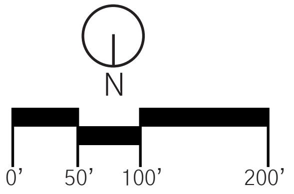
New Roadway

Bus Circulation

Parent Circulation

Connection

Utility



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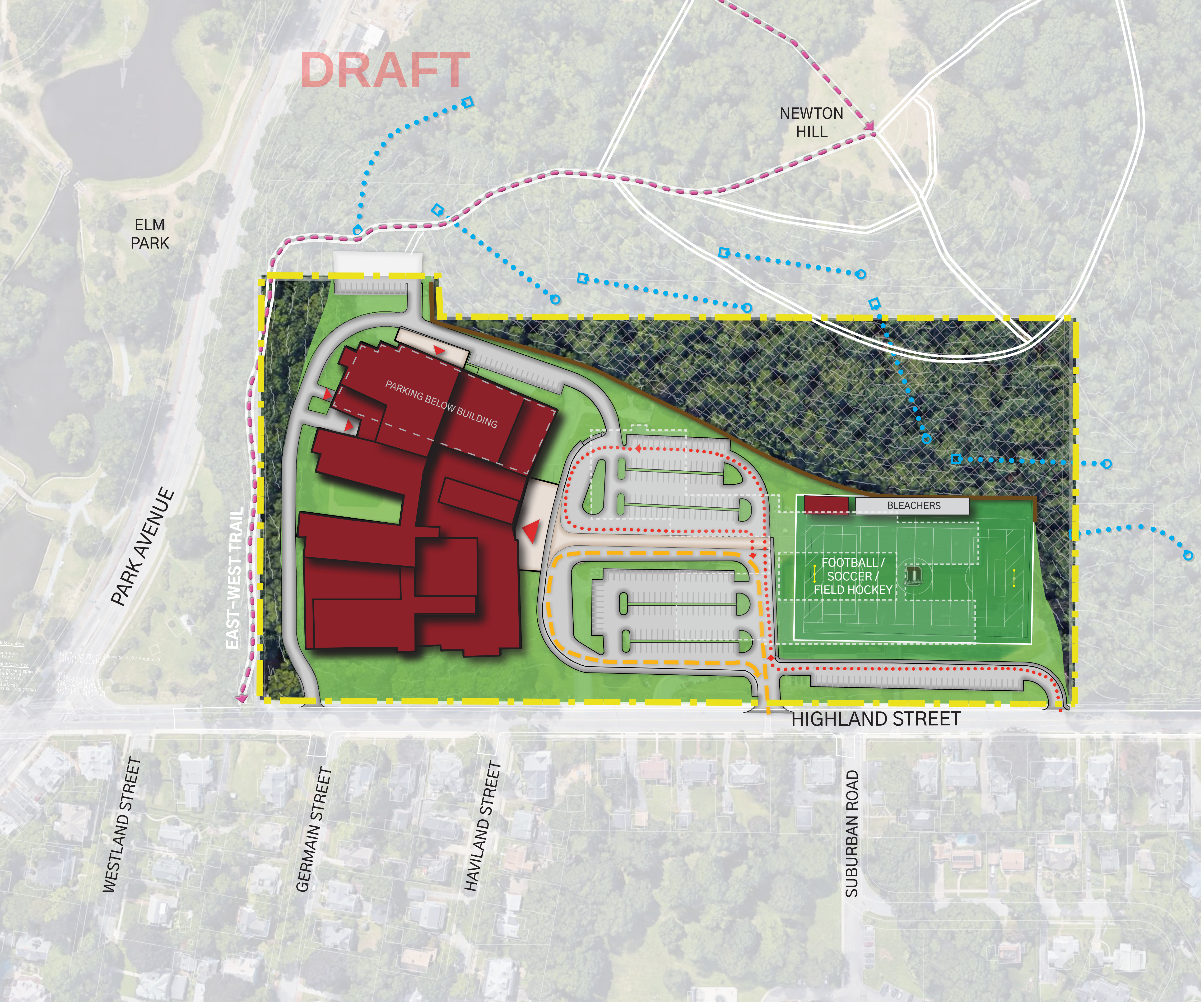
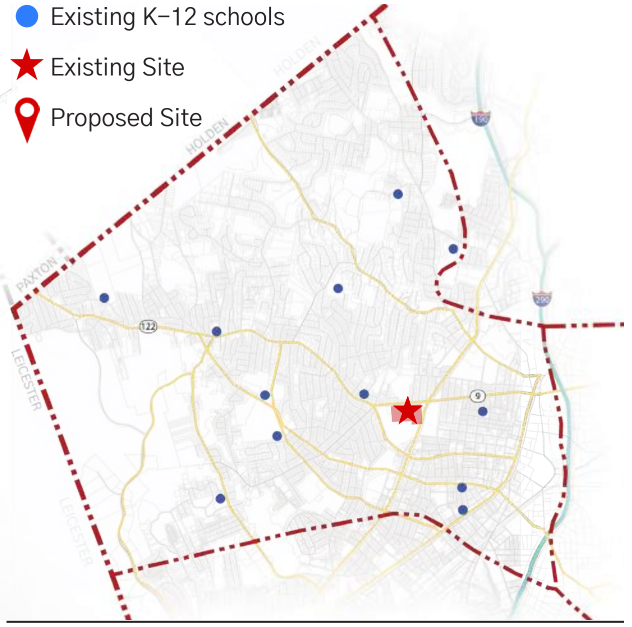


3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
3. Option A.1 New Construction on Doherty Site
PODS ON PARK
b. Site Plan

NOTES:

- Pod configuration is ideal for views and daylight
- Parking below–building for +/– 100 Staff

QUADRANT KEY PLAN:



● Existing K–12 schools
★ Existing Site
📍 Proposed Site

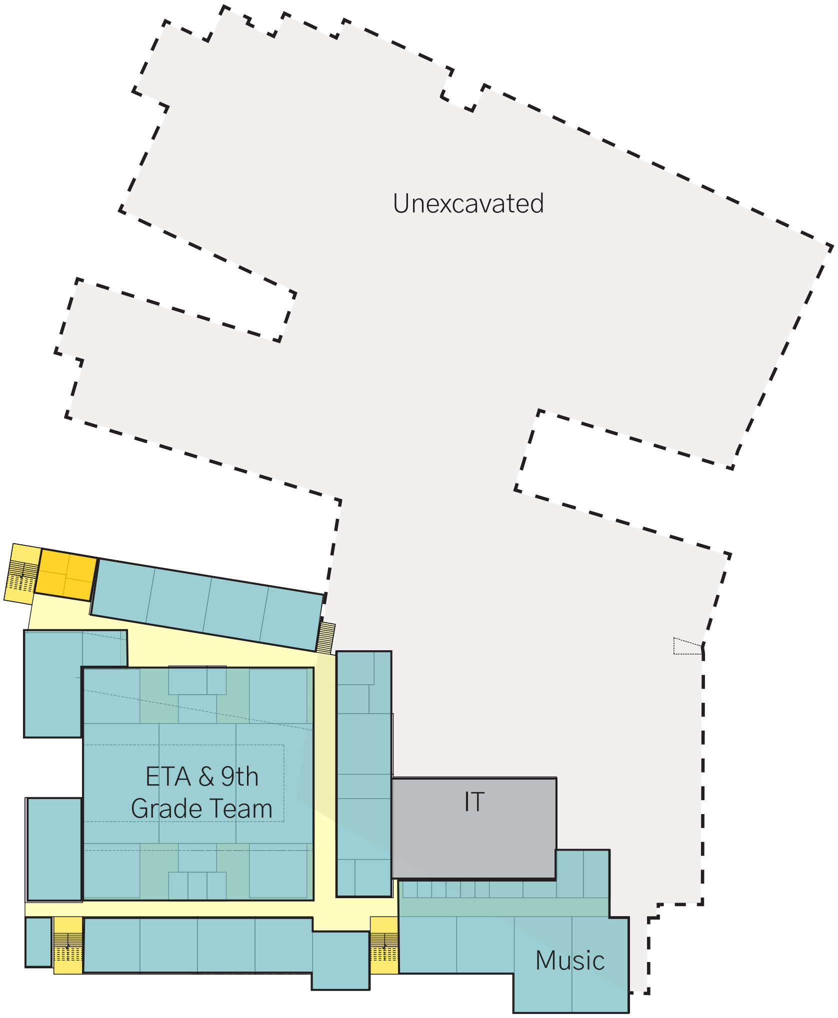
LEGEND:

⬚ Parcel Property Line
🟨 Potential acquisition
🟥 New Construction
🟩 New Athletic Field
⬚ Existing Building
⬚ Flood Plain
⬚ Wetland
▬ Retaining Wall
▨ Steep Topography
▲ Entrance
▬ New Roadway
➡ Bus Circulation
➤ Parent Circulation
➡ Connection
▬ Utility

N

0' 50' 100' 200'

LPA|A



FIRST FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY

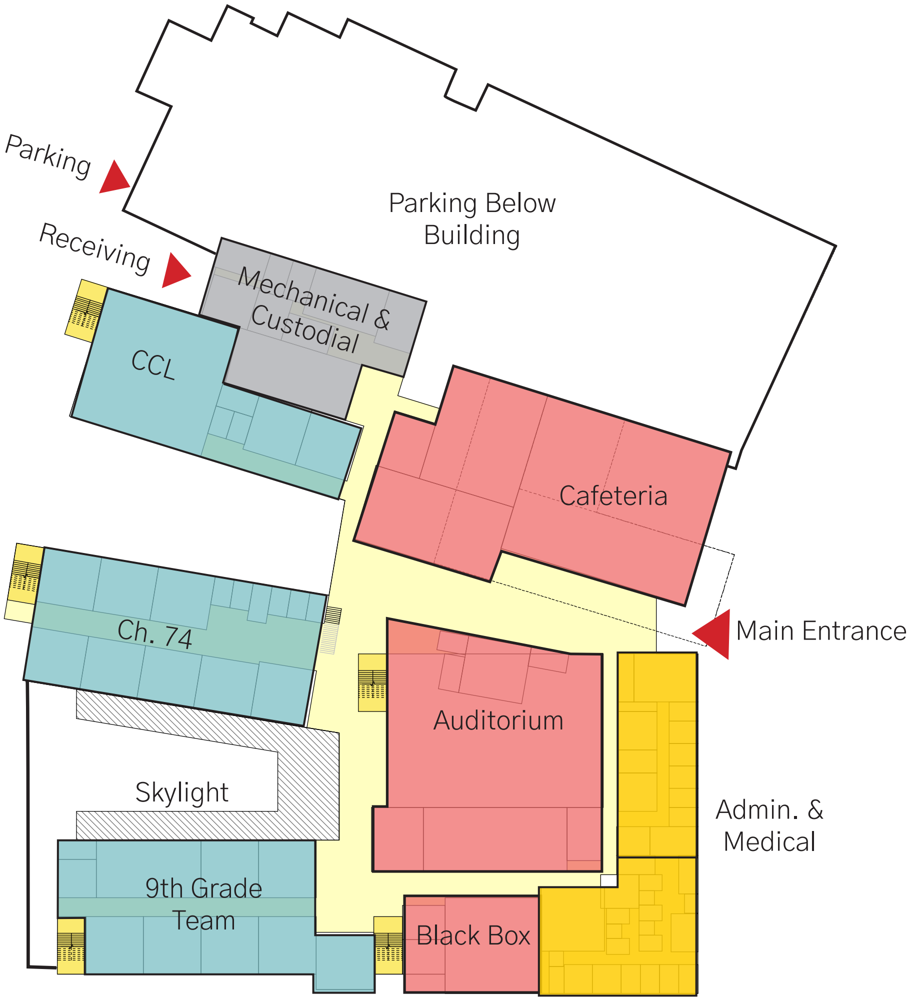
🟦 ACADEMIC

🟨 ADMINISTRATION

⬛ BUILDING SERVICE

⬜ CIRCULATION

N



SECOND FLOOR

1"=100'

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬛ BUILDING SERVICE
- ⬜ CIRCULATION

N

THIRD FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY

🟦 ACADEMIC

🟨 ADMINISTRATION

⬜ BUILDING SERVICE

⬜ CIRCULATION

N

FOURTH FLOOR

1"=100'

LEGEND

🟥	CORE FACILITY
🟦	ACADEMIC
🟨	ADMINISTRATION
▨	BUILDING SERVICE
⬜	CIRCULATION

N

FIFTH FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N

Doherty Memorial High School

299 Highland Street, Worcester MA

SIXTH FLOOR

1”=100’

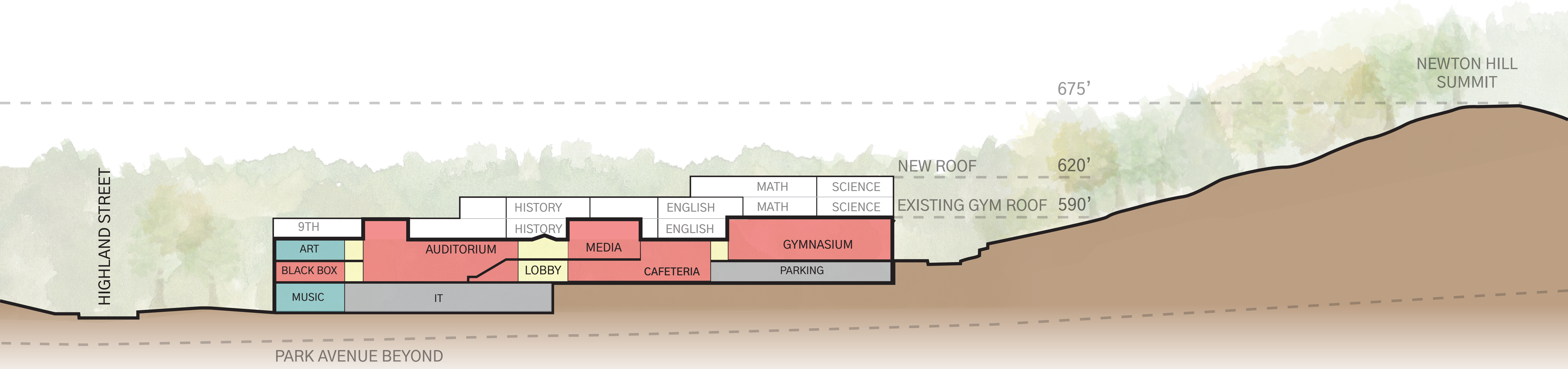
LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N

FEASIBILITY STUDY

DRAFT



Doherty Memorial High School

299 Highland Street, Worcester MA

LPA|A

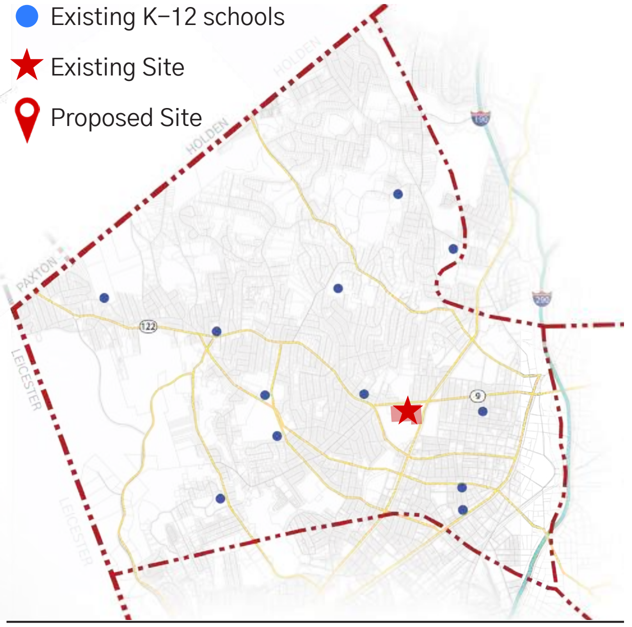
3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
3. Option A.1 New Construction on Existing Site:
PODS ON PARK
d. Massing View

3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
3. Option A.1 New Construction on Doherty Site
f. Phasing Plans–PHASE I

NOTES:

- Construction separation
- Pave around existing building to maximize parking
- No practice fields available

QUADRANT KEY PLAN:



- ● Existing K–12 schools
- ★ Existing Site
- 📍 Proposed Site

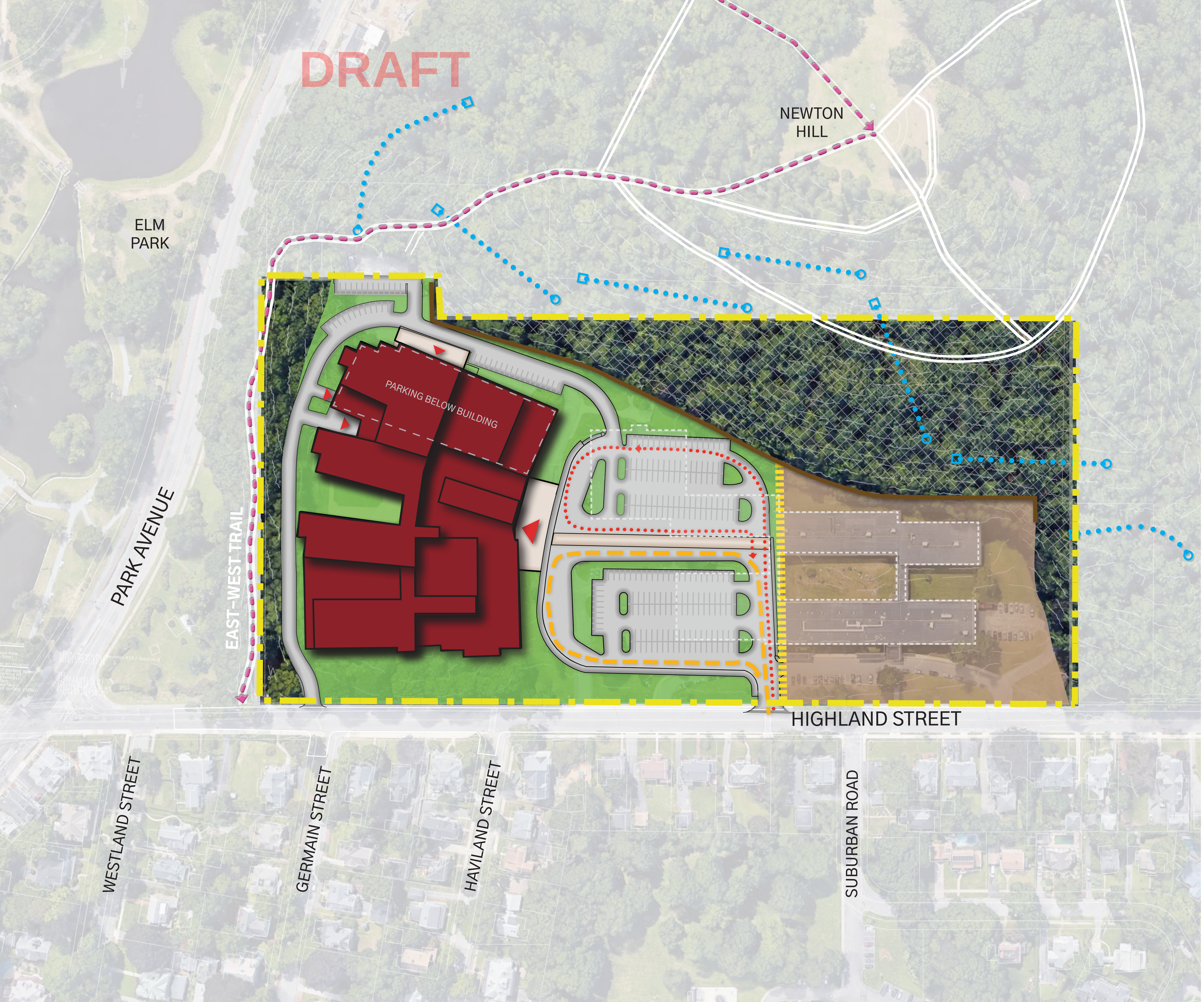
LEGEND:

- ▨ Parcel Property Line
- ▨ Potential acquisition
- 🟥 New Construction
- 🟩 New Athletic Field
- ▨ Existing Building
- ▨ Flood Plain
- ▨ Wetland
- ▬ Retaining Wall
- ▨ Steep Topography
- ▲ Entrance
- ▬ New Roadway
- ➔ Bus Circulation
- ➔ Parent Circulation
- ➔ Connection
- ▬ Utility

N

0' 50' 100' 200'

LPA|A



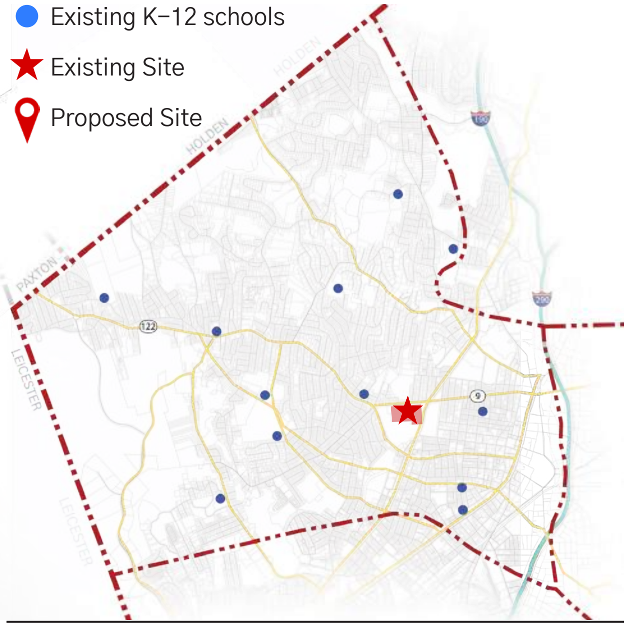
3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
3. Option A.1 New Construction on Doherty Site
f. Phasing Plans–PHASE II

NOTES:

- Abatement and Demolition of existing building
- Construction of roads for bus circulation
- Occupancy of new building

QUADRANT KEY PLAN:

- ● Existing K–12 schools
- ★ Existing Site
- 📍 Proposed Site



LEGEND:

- ⬚ Parcel Property Line
- ▨ Potential acquisition
- 🟥 New Construction
- 🟩 New Athletic Field
- ⬚ Existing Building
- ⬚ Flood Plain
- ⬚ Wetland
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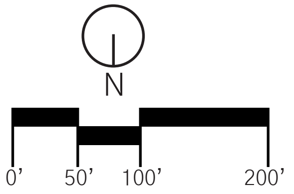

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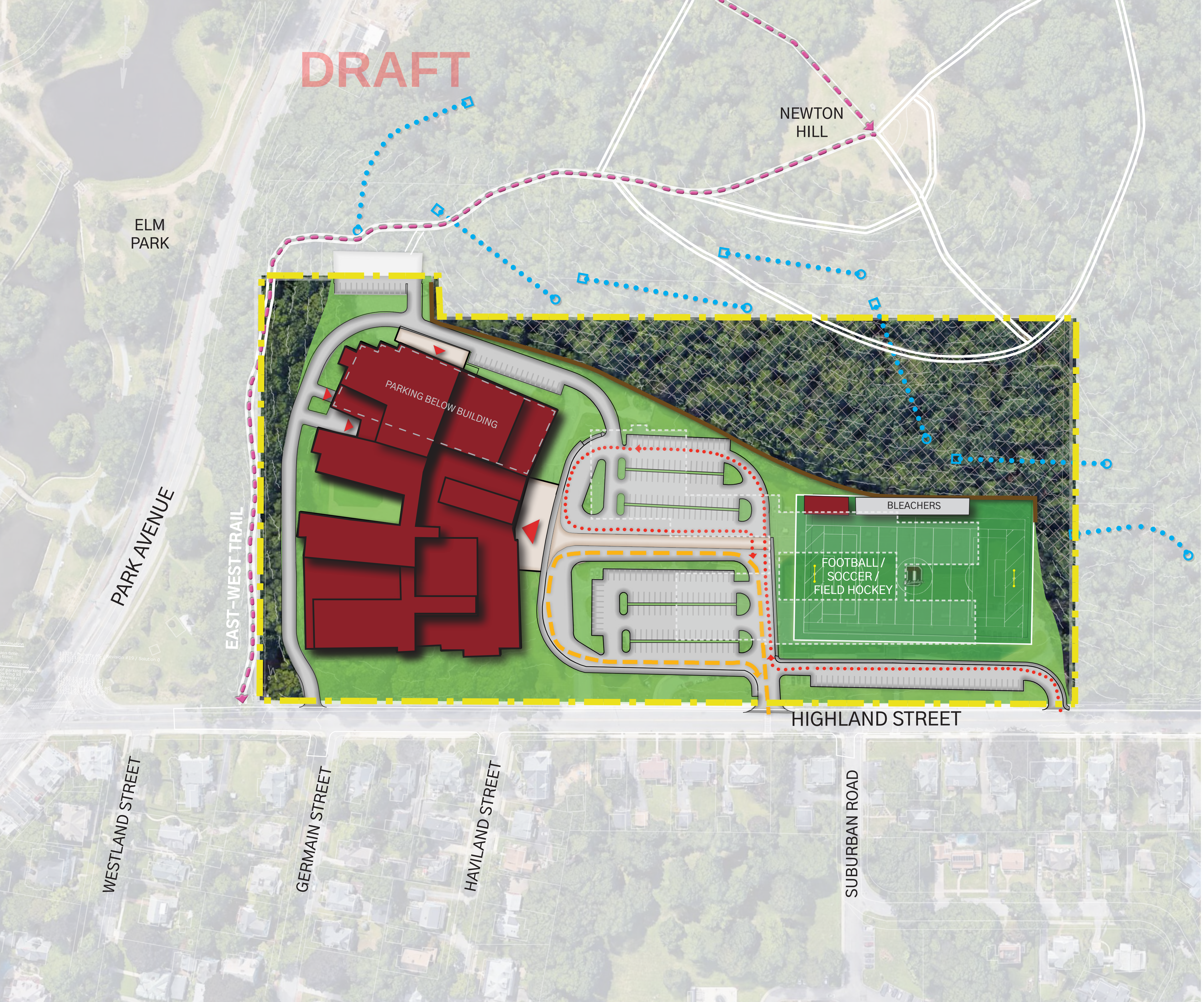


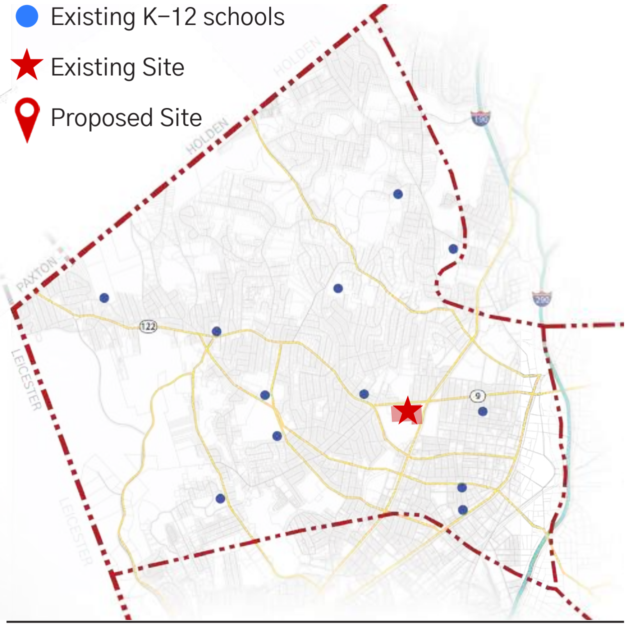
3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
3. Option A.1 New Construction on Doherty Site
f. Phasing Plans–PHASE III

NOTES:

- Extended schedule for completion of site work and athletic fields above parking
- Field completed Fall of 2025

QUADRANT KEY PLAN:

● Existing K–12 schools
★ Existing Site
📍 Proposed Site



LEGEND:

- ▭ Parcel Property Line
- ▨ Potential acquisition
- 🟥 New Construction
- 🟩 New Athletic Field
- ▭ Existing Building
- ▭ Flood Plain
- ▭ Wetland
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- • • • ➔ Parent Circulation
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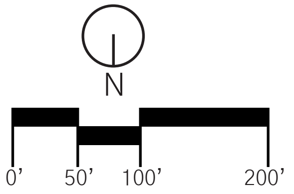


3.3.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options

4. Option A.2 New Construction on Existing Site: Olmsted Homage

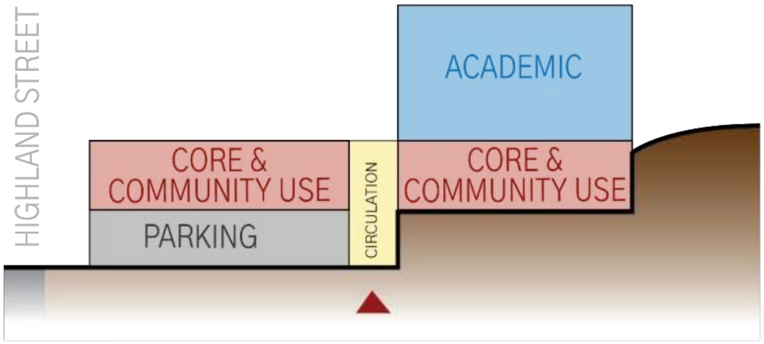
a. Narrative
b. Site Plan
c. Floor Plans
d. Section
e. Massing

4. Option A.2 New Construction on Existing Site: OLMSTED HOMAGE

a. Narrative

SUMMARY: The New Construction Option is based on a new building located on the adjacent field area east of the existing building, and assumes that the new building will be constructed while the existing building remains fully occupied. Once the new building is complete, the existing building would be demolished in its entirety and any remaining site features (athletic fields, parking, driveways, etc.) would be completed. While there will be **temporary** construction impacts with this option, most notably the loss of nearly all existing outdoor areas and student parking capacity in part, they are primarily site-related and the end result is a solution that meets most if not all of the Educational Program requirements. However, given the limited acreage of developable site, the sports fields site program will not be met.

PARTI DIAGRAM:



BUILDING ORGANIZATION:

The design concept for Option A.2 Olmsted Homage was to maximize the parking beneath the building in an effort to reduce surface paving, provide fields on-grade and to allow for increased vegetation and open space on site. In this option, the building is organized with all the core and community spaces on one floor and accessible near the main entrance that features a central two-story lobby. The building is organized into a total of 6 levels that terrace up the site's steep topography, but the majority of the building is limited to four stories in height. This configuration provides daylight to the majority of classrooms, and exterior access to the main entrance, the receiving area, Life Skills and the ETA Suite. The academic areas "pinwheel" around the central lobby and auditorium, and compared to the other building options, the academic organization is less intuitive. Given this organization, access control between community and academic spaces could be challenging to address. The massing along Highland Street would feature the Music and Art classrooms, which could engage the street and be aesthetically interesting. The academic wings are built into the existing steep topography. This organization provides daylight to the majority of classrooms, but half of the classrooms would have exterior views primarily overlooking the roofs below. In summary, the strength of this scheme is the use of underbuilding area for parking, core and community space adjacencies and placement, while the deficits include the overall organization of its academic areas and strength of the interior to exterior visual connections.

SITE CONFIGURATION:

The proposed site for Option A.2 creates a traffic circle that would separate bus and parent drop-off and pick-up on site with two distinct routes. This organization creates an opportunity to enhance the central main entrance with an entrance plaza and a central pedestrian pathway to the fields. The PDP submission site plans and cost estimate for the New Construction on Existing Site option included a parking deck below an elevated football field. Option A.2 was refined to include a parking garage with approximately 180 staff parking spaces below half of the building. Relocating the parking garage below the building was found to be more cost effective, more efficient and more aesthetically pleasing as the football field could then be built on grade. With the reduced surface parking afforded by the larger parking garage there is adequate clearance for a road to the south of the new football field, allowing for an added practice field and generally more green space along Highland Street. Lastly, this option will allow for a clear north-south construction separation fence, allowing the school's existing staff parking lot to remain functional throughout construction. Refer to the Civil and Traffic Basis of Design narratives in section 3.3.3.D.1 for additional analysis.

OPTION ANALYSIS:

Proposed SF areas for this option are approximately as follows:

▪ **New Construction**	**= 420,000 GSF**
▪ **Demolition (existing building)**	**= 167,000 GSF**

ABILITY TO MEET BUILDING PROGRAM:

This New Construction Option satisfies most if not all Educational Program/Space Summary objectives.

ACQUISITION ISSUES:

The Site is bounded by park land; there are no expansion options or acquisition issues. The Doherty sports programs utilize Foley Stadium for practices and games. Improved access to Foley would be beneficial.

COMPARATIVE STAFF AND STUDENT IMPACT:

4. Option A.2 New Construction on Existing Site: OLMSTED HOMAGE

a. Narrative

It is assumed that the work will begin with construction of a new building, including associated sitework infrastructure, to be located on the field area east of the existing building. We anticipate that the entire practice football field, and the student/Newton Hill visitor parking lot, will be consumed by the building and the Contractor for staging material laydown/storage, worker/equipment parking areas and temporary office trailers. During this time the existing building would remain fully occupied and functional, at least internally, much like it does presently. Externally, construction access would impact vehicular traffic and parking patterns as well as the loss of the PE/Athletic practice fields. We expect that the Contractor will access the site via the driveway and parking area to the side of the existing building, however, construction access may also have a construction only access road at the east side. Similar to the Code Upgrade and Renovation/Addition Options, the summer break will be leveraged to maximize productivity for work (i.e. sitework such as repaving, new site utilities, drainage infrastructure, etc.) that would normally disturb school vehicular/pedestrian traffic.

Because a new building can be constructed entirely outside the footprint of the existing building (which can remain fully occupied), the New Construction Option will have less impact to students than the Code Upgrade or Renovation/Addition Options, all without the need for "swing space". As previously noted, the biggest temporary construction impacts are site-related and include the following:

- Loss of PE/Athletic fields and other outdoor spaces during construction.
- Loss of student parking.
- Relocation of pedestrian/vehicular traffic and staff/faculty parking from a reconfigured site layout, designated parking areas, and a dedicated construction access-way.

One advantage of New Construction is that it doesn't have the same limitations, in terms of work area, as either the Code Upgrade or Renovation/Addition Options. More workers can be productive because there is a greater area to work in. Consequently, the duration of the project can be less than an occupied project which has numerous phases with complex scope of work, relocations, and temporary support facilities. Like the other options, the New Construction Option will leverage summer breaks to maximize productivity, particularly site-related, and reduce construction impacts.

ABILITY TO MEET SITE ATHLETICS PROGRAM

While the program ideally would have all the desired fields on the same site, limited field development is anticipated. The proposed site plan shows a football/soccer/field hockey field with bleachers and an outdoor toilet building. The surface parking is reduced due to the below-building parking garage, so this option provides the most green-space on site, including an additional practice field. The off-site fields at Foley Stadium will still be beneficial to supplement the athletic program.

CENTRAL TO DISTRICT/QUADRANT:

The existing school site is recognized as central to the Doherty Quadrant.

SITE DEVELOPMENT COSTS:

The Soils test from the original construction and record information indicate heavy glacial till and assumed ledge or boulders. Short to moderate height retaining walls are anticipated to optimize site area available. Conceptual designs include moderate soils cutting at existing the sports field and parking garage. To better meet the site program, an underground parking garage is proposed beneath the building.

TRAFFIC IMPACTS & ACCESS:

The existing Doherty site is limited to access from Highland Street only, which has limitations, and is subject to traffic congestion. Refer to Section 3.3.3.D.1 for an updated traffic analysis.

BUS & PARENT VEHICULAR CIRCULATION & PARKING:

This site plan for this option creates a traffic circle that would safely separate bus and parent drop-off and pick-up on site. All vehicular access is from Highland Street, adding to traffic flow complexities. In order to achieve the required student parking, the cost estimate assumes that staff parking will be provided beneath half of the building footprint, at the lowest level. The underground parking represents a moderate cost and may result in some security/surveillance issues. Perimeter access around the building for emergency vehicles is provided per requirements.

CONSTRUCTION SCHEDULE IMPACT:

With the phased construction, the building is anticipated to meet the current occupancy goal of Fall 2024, however the fields will not be completed and available for use until the following year. Early bid packages are anticipated as follows:

- Design Development Submission and Site Enabling Bid Package
- 60% Construction Document Submission and Early Site Work Bid Package
- 90% Construction Document Submission and Early Concrete and Steel Bid Package

The conceptual project phasing at the time of this report is as follows:

ENABLING SITEWORK PACKAGE (06/2021 to 9/2021):

- Mobilize on site; Install temporary retaining walls at Highland Street, excavation and slope mitigation at the rear of the school. Regrade and install paving around the building create fenced dedicated construction access driveway to the east of the existing building; prepare northernmost lower parking area as CM/Subcontractor area for temporary facilities, storage, parking, etc.

PHASE 1 (10/2018 to 6/2024):

- Mobilize on site; create fenced dedicated construction access driveway around southwest of existing building; prepare northernmost lower parking lot as CM/Subcontractor area for temporary facilities, storage, parking, etc.
- Perform early sitework scope including site prep for new building, new utilities, construction access to lower parking lot, new terraced parking lots and perimeter driveway (Early bid packages are anticipated for Site Work, Concrete and Steel.
- Construct new building

PHASE 2 (6/2024 to 9/2024):

- Abate hazardous materials and demolish existing part of existing school, beginning with the areas closest to the new building (Gymnasium, ETA, Music, Auditorium and Classrooms)
- Perform sitework scope including new staff parking and driveways at main entry
- Receive and install FF&E
- Occupy existing building for the 2024 school year.

PHASE 3 (9/2024 to 5/2025):

- Perform remaining sitework scope including new synthetic field, bleachers and outdoor toilet building, finish paving, landscaping and other site improvements
- Demobilize

ADJACENT USES & NEIGHBORHOOD IMPACT:

The existing school is an established location, so impact on the neighborhood is expected to be limited primarily to construction related activities, with a minor increase of traffic due to the added enrollment. The southern portion of the site that is currently undeveloped is used by the Newton Hill parks programs, disc golf, trails, and buffer land with no significant disruptions anticipated. Discussions have been held to consider mutually beneficial opportunities to link the school property and the park. Possible solutions discussed include improvement of trails on Newton Hill, provision of parking spaces for access to the park after hours, green retaining walls and other facility improvements.

Historical Elm park is also across Park Avenue to the east, which represents opportunities for views and visual connections.

UTILITIES & DEVELOPMENT ISSUES:

Utilities are available and adequate. Refer to the Civil Basis of Design narrative in Section 3.3.3.D.1.

ADDITIONAL CITY COSTS (NOT ELIGIBLE FOR MSBA REIMBURSEMENT)

LPA|A reviewed opportunities to supplement Doherty's athletic fields, both during construction and after completion. One option for expansion is the addition of a rectangular football/soccer/field hockey field at the existing nearby Duffy Softball Field. Other City offsite scope may include improvements for traffic management and pedestrian crosswalks.

Other option City costs include:

- Temporary Off-Site parking through construction
- Newton Hill trail improvements
- Improved Access to Foley Field (land cost of rear land of three Abbott Street parcels)
  - Development of added land with new basketball or tennis courts and Surface Parking
- Beaver Brook practice field improvements (underdrains)
- Foley Stadium Improvements to Rear Fields

The total added city costs for this Option would range between $6-11 Million. Refer to Section 3.3.3.D.3 Offsite improvements for more information.

NEW CONSTRUCTION SCOPE OF WORK:

Site:

Provide full site accessibility to comply with 521 CMR including:

- Provide an accessible route, via new sidewalks ramps, and curb cuts, from Highland Street
- Refer to Civil and Traffic Basis of Design narratives in Section 3.3.3.D.1.

Building Exterior/Interior:

- Refer to the Architectural Basis of Design Narrative in Section 3.3.3.D.1.

Sustainability / Net Zero Energy Goal:

- Provide infrastructure required for sustainable building project, and net zero energy goals
- The City / School Facilities departments have developed a list of preferred systems and equipment choices that are maintainable, durable and efficient, and updates their list with newer equipment as systems come on the market.
- A design charrette will be scheduled early in the design process to solicit input and priorities in an effort to determine the best strategies for this project. The Sustainable Design consultant and MEP consultants will attend and present new energy saving strategies for consideration.
- One approach used in the past that would be continued on this project are to maximize the R value of the building envelope, including components such as windows and doors.
- Refer to the MEP narratives for additional information.

Fixtures, Furnishings & Equipment (FF&E)/Technology:

- Provide new FF&E throughout including furnishings, equipment, maintenance items, etc.
- Provide new Technology throughout including student/teacher computers, mobile device charging carts, interactive projectors, servers, etc.

Hazardous Materials:

- Abate entire existing building prior to demolition
- Provide radon mitigation system at Lower Level slab–on–grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:

- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

Food Services:

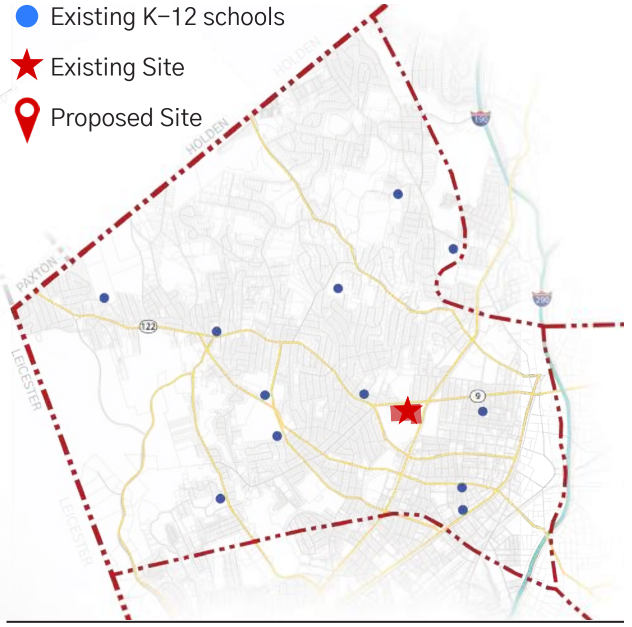
- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.

3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
4. Option A.2 New Construction on Doherty Site
OLMSTED HOMAGE
b. Site Plan

NOTES:

QUADRANT KEY PLAN:

● Existing K–12 schools
★ Existing Site
📍 Proposed Site



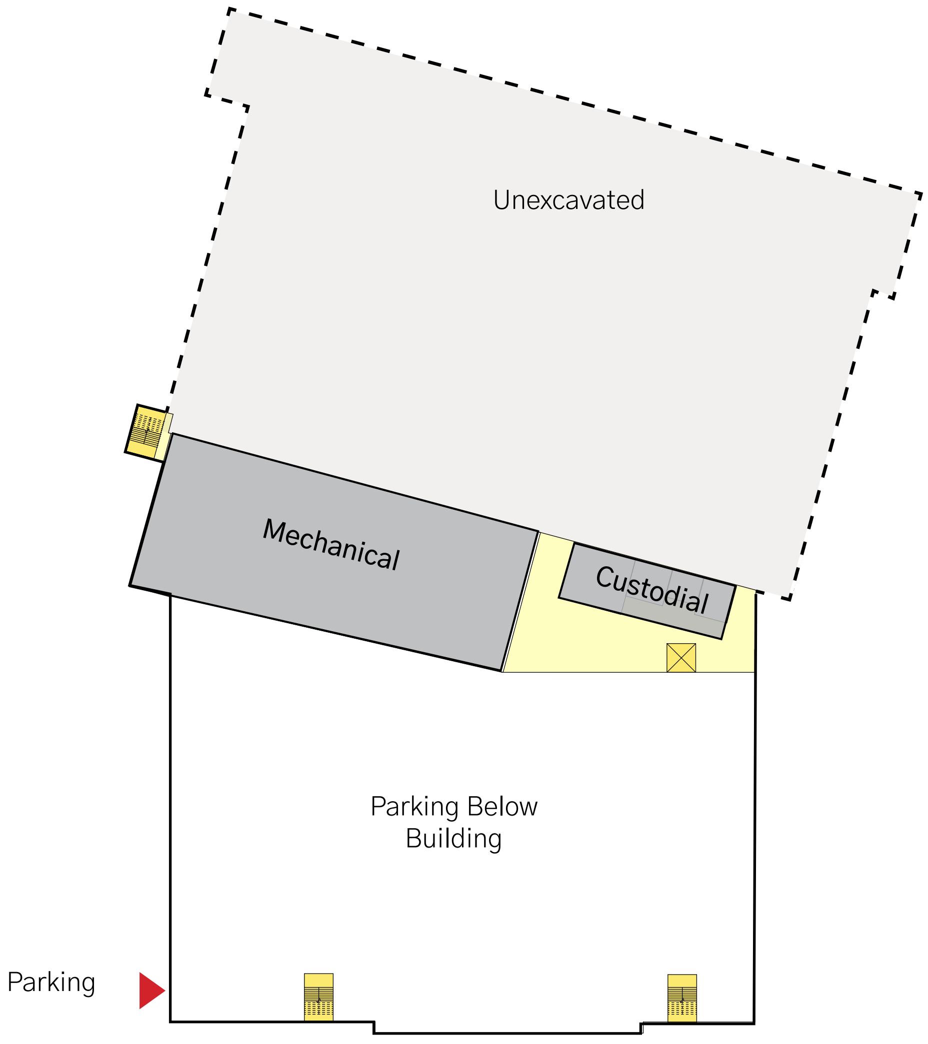
LEGEND:

▨ Parcel Property Line
▨ Potential acquisition
🟥 New Construction
🟩 New Athletic Field
▨ Existing Building
▨ Flood Plain
▨ Wetland
▬ Retaining Wall
▨ Steep Topography
▲ Entrance
▬ New Roadway
➔ Bus Circulation
➔ Parent Circulation
➔ Connection
▬ Utility

N

0’ 50’ 100’ 200’

LPA|A



FIRST FLOOR

1”=100’

LEGEND

N

🟥 CORE FACILITY
🟦 ACADEMIC
🟨 ADMINISTRATION
▨ BUILDING SERVICE
◻ CIRCULATION

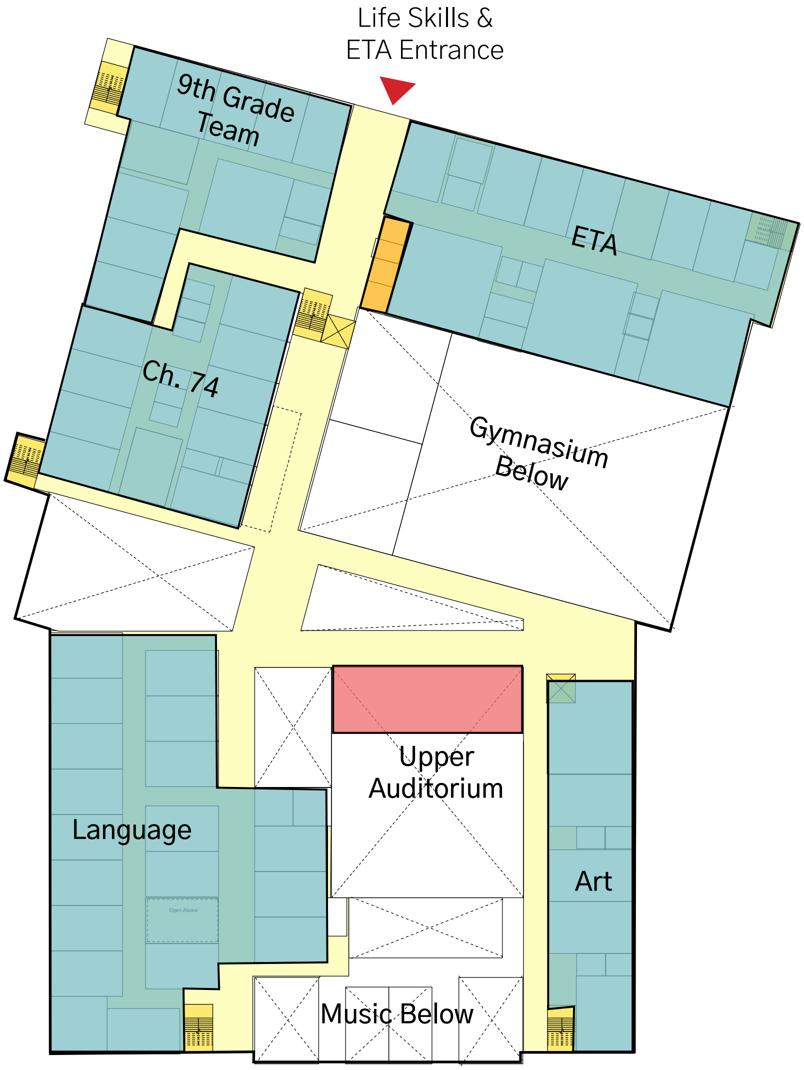
SECOND FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬛ BUILDING SERVICE
- ⬜ CIRCULATION

N

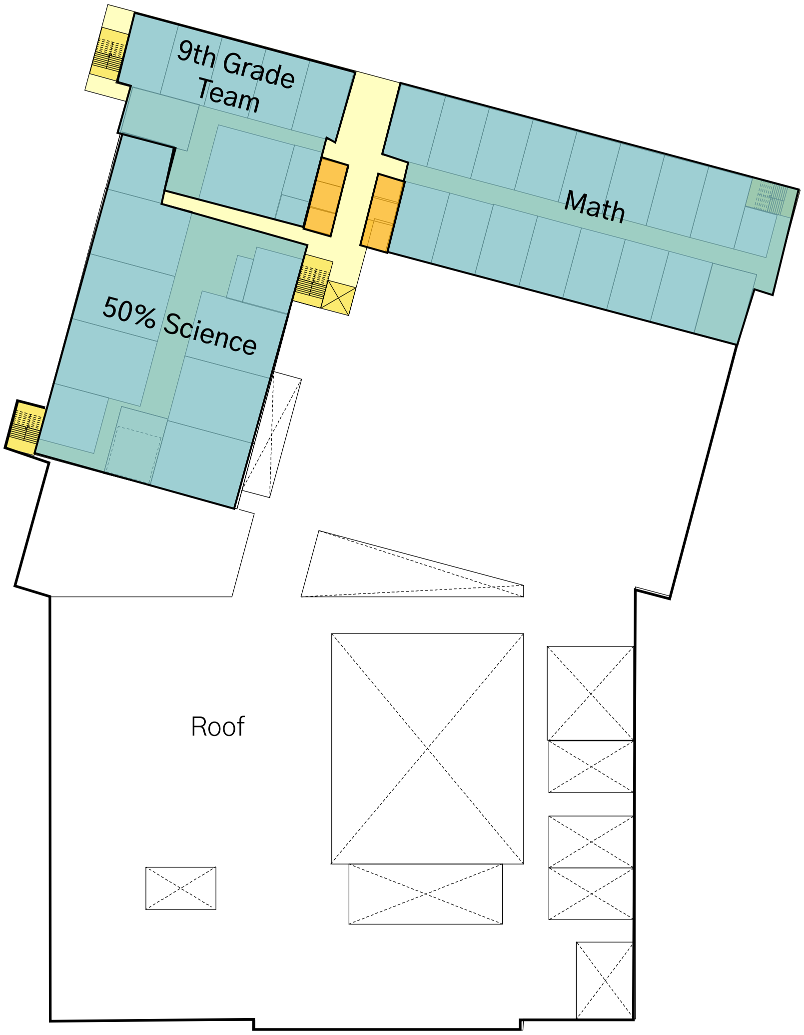


THIRD FLOOR
1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N



FOURTH FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬛ BUILDING SERVICE
- ⬜ CIRCULATION

N

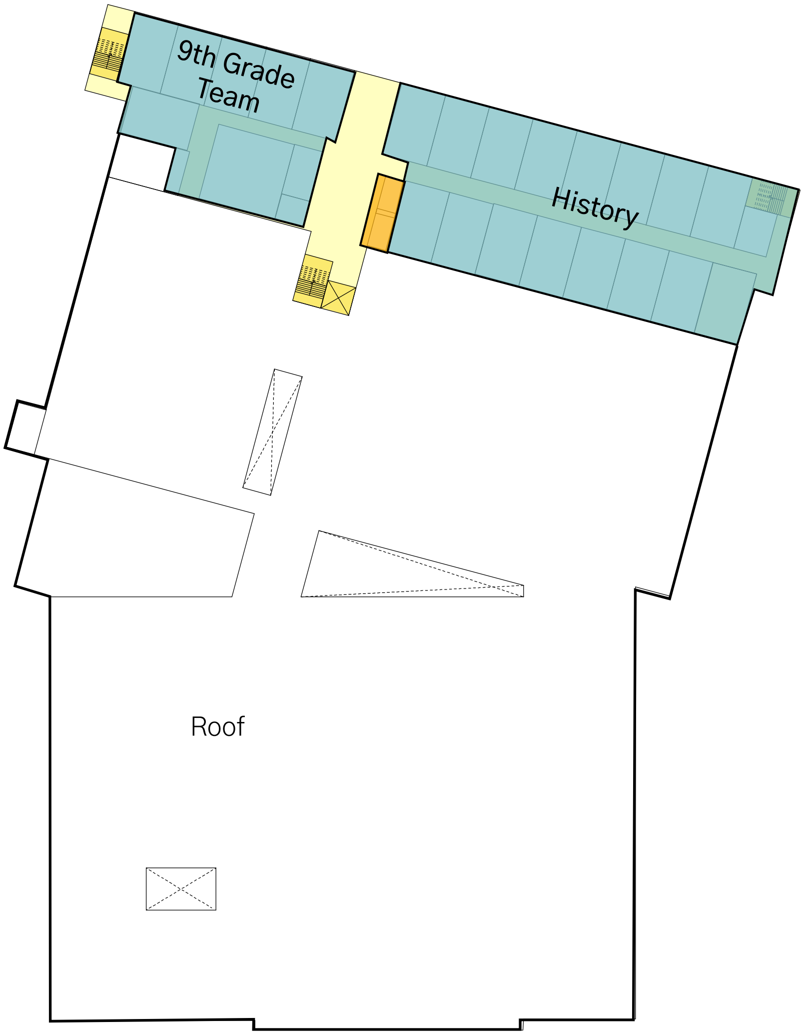
FIFTH FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N



SIXTH FLOOR

1”=100’

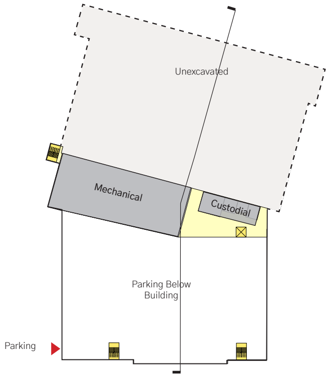
LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N

FEASIBILITY STUDY

3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
4. Option A.2 New Construction On Existing Site
OLMSTED HOMAGE
d. Section



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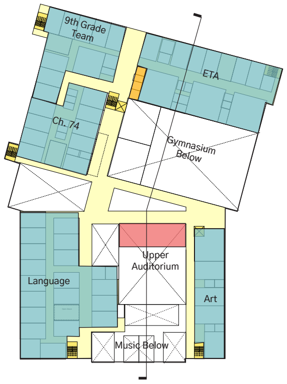

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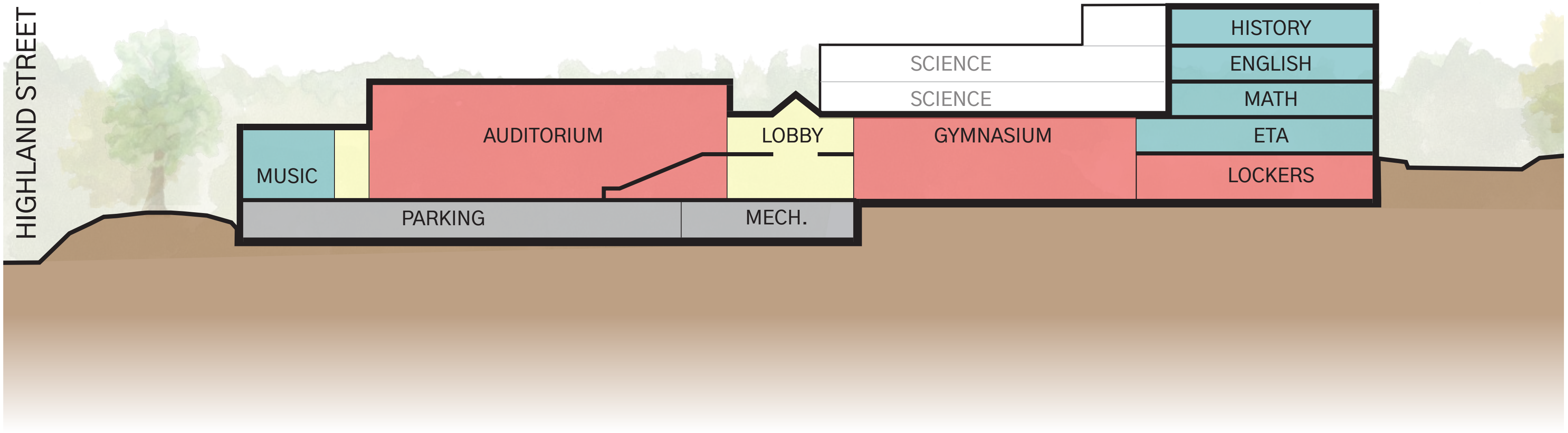
4

5

6

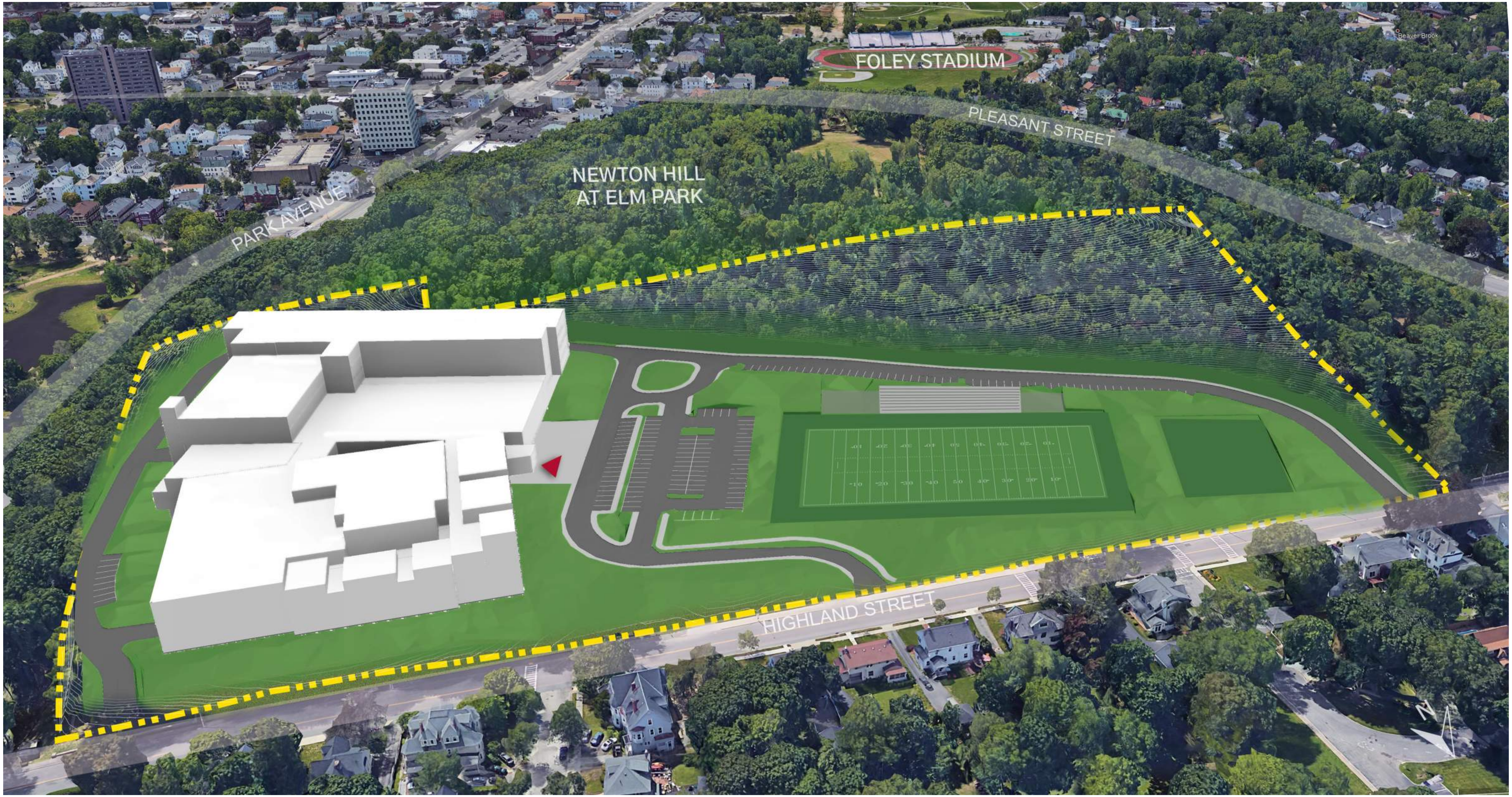


Doherty Memorial High School

299 Highland Street, Worcester MA

LPA|A

3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
4. Option A.2 New Construction on Existing Site:
OLMSTED HOMAGE
e. Massing View



3.3.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options

5. Option A.3 New Construction on Existing Site: Highland Proud

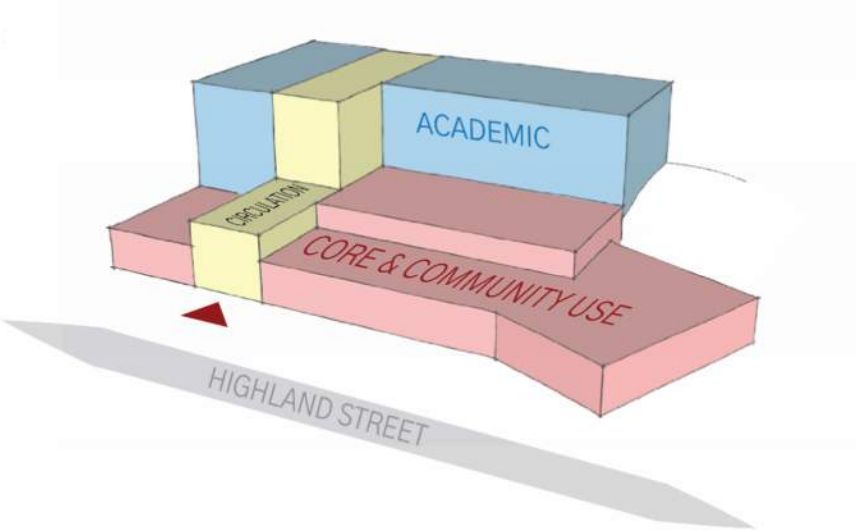
a. Narrative
b. Site Plan
c. Floor Plans
d. Section
e. Massing

5. Option A.3 New Construction on Existing Site: HIGHLAND PROUD

a. Narrative

SUMMARY: The New Construction Option is based on a new building located on the adjacent field area east of the existing building, and assumes that the new building will be constructed while the existing building remains fully occupied. Once the new building is complete, the existing building would be demolished in its entirety and any remaining site features (athletic fields, parking, driveways, etc.) would be completed. While there will be **temporary** construction impacts with this option, most notably the loss of nearly all existing outdoor areas and student parking capacity in part, they are primarily site-related and the end result is a solution that meets most if not all of the Educational Program requirements. However, given the limited acreage of developable site, the sports fields site program will not be met.

PARTI DIAGRAM:



BUILDING ORGANIZATION:

The building in Option A.3 Highland Proud is organized with a central circulation spine that bisects the building as it climbs up the existing site's steep topography. This strong circulation spine provides clarity of circulation and organization and creates an opportunity for visual and physical connections between floors. This option pushes the building mass further away from the roadway, allowing space for a dedicated bus loop in front of a "classic" main entrance on Highland Street.

The building is organized into a total of 6 levels that step up the site's steep topography. However, the terraced approach ensures that the majority of the of the building is no more than four stories in height. This configuration provides grade access at the main entrance at Highland Street and a secondary entrance at the Gymnasium facing toward the parking area and fields. Exterior access is also provided for the receiving area, the ETA Suite and Life Skills classrooms. The core and community spaces would be located on the first and second levels, connected by a large "google" staircase within the central circulation spine. The lowest levels are buried into the existing topography, resulting in some teaching spaces without natural daylight, such as the Chapter 74 classrooms and computer labs. The general academic classrooms are organized by department on the upper floors, located to the east and west of the main circulation spine. Access control between community and academic spaces would occur between the second and third floor. The massing along Highland Street would be limited to two or three stories, and would feature active and aesthetically interesting spaces such as the Cafeteria, Media Center, and Art / Music classrooms.

SITE CONFIGURATION:

The proposed site for Option A.3 is distinct as it locates the main entrance and bus loop at the lowest level along Highland Street. In order to accomplish this frontage on the main access street, the building footprint was expanded into the existing staff parking lot, which would result in comparatively greater impact on the existing school parking during construction and more complex construction separation. However, the area in front of the proposed building (the location of the future bus loop) would provide the contractor with a large staging area throughout construction.

The PDP submission site plans and cost estimate for the New Construction on Existing Site option included a parking deck below an elevated football field. To achieve the desired number of parking spaces, this option also includes a new turf football/soccer/field hockey field construction on an elevated deck above an open-air parking garage. Refer to the Civil and Traffic Basis of Design narratives in section 3.3.3.D.1 for additional analysis.

OPTION ANALYSIS:

Proposed SF areas for this option are approximately as follows:

▪ **New Construction**	**= 420,000 GSF**
▪ **Demolition (existing building)**	**= 167,000 GSF**

ABILITY TO MEET BUILDING PROGRAM:

Option A.3 satisfies most if not all Educational Program/Space Summary objectives. This option's organization locates the Main Administration suite and the Media Center at the lowest (main entrance) level and these spaces are remote from the bulk of the academic spaces on the upper levels. Terracing into the existing topography allows secondary entrance to the gymnasium, and exterior access to receiving, and life skills and ETA, but also results in some "buried" spaces without natural daylight. This option ensures that the majority of the teaching spaces will have direct or borrowed daylight, however, some of the Chapter 74 spaces and computer labs are completely interior. The academic wings are built into the existing steep topography, but with this organization, approximately half of the classrooms would have exterior views overlooking the roofs below, which is considered to be less architecturally desirable.

ACQUISITION ISSUES:

The Site is bounded by park land; there are no expansion options or acquisition issues. The Doherty sports programs utilize Foley Stadium for practices and games. Improved access to Foley would be beneficial.

COMPARATIVE STAFF AND STUDENT IMPACT:

It is assumed that the work will begin with construction of a new building, including associated sitework infrastructure, to be located on the field area east of the existing building. We anticipate that the entire practice football field, and the student/Newton Hill visitor parking lot, will be consumed by the building and the Contractor for staging material laydown/storage, worker/equipment parking areas and temporary office trailers. During this time the existing building would remain fully occupied and functional, at least internally, much like it does presently. Externally, construction access would impact vehicular traffic and parking patterns as well as losing the PE/Athletic practice fields. Option A.3 Highland proud has a comparatively greater construction site impact, as the building footprint is on top of the existing Staff parking area. Temporary off-site parking or shuttling may be required. We expect that the Contractor will access the site via the driveway and parking area to the side of the existing building, however, construction access may also have a construction only access road at the east side. Similar to the Code Upgrade and Renovation/Addition Options, the summer break will be leveraged to maximize productivity for work (i.e. sitework such as repaving, new site utilities, drainage infrastructure, etc.) that would normally disturb school vehicular/pedestrian traffic.

Because a new building can be constructed entirely outside the footprint of the existing building (which can remain fully occupied), the New Construction Option will have less impact to students than the Code Upgrade or Renovation/Addition Options, all without the need for “swing space”. As previously noted, the biggest temporary construction impacts are site-related and include the following:

- Loss of PE/Athletic fields and other outdoor spaces during construction.
- Loss of staff and student parking, temporary off-site parking or shuttles may be required for staff.
- Relocation of pedestrian/vehicular traffic and staff/faculty parking from a reconfigured site layout, designated parking areas, and a dedicated construction access-way.

5. Option A.3 New Construction on Existing Site:
HIGHLAND PROUD

a. Narrative

One advantage of New Construction is that it doesn't have the same limitations, in terms of work area, as either the Code Upgrade or Renovation/Addition Options. More workers can be productive because there is a greater area to work in. Consequently, the duration of the project can be less than an occupied project which has numerous phases with complex scope of work, relocations, and temporary support facilities. Like the other options, the New Construction Option will leverage summer breaks to maximize productivity, particularly site-related, and reduce construction impacts.

ABILITY TO MEET SITE ATHLETICS PROGRAM

While the program ideally would have all the desired fields on the same site, limited field development is anticipated. The proposed site plan shows an elevated football/soccer/practice field above an open-air parking deck. The off-site fields at Foley Stadium will still be beneficial to supplement the athletic program.

CENTRAL TO DISTRICT/QUADRANT:

The existing school site is recognized as central to the Doherty Quadrant.

SITE DEVELOPMENT COSTS:

The Soils test from the original construction and record information indicate heavy glacial till and assumed ledge or boulders. Short to moderate height retaining walls are anticipated to optimize site area available. Conceptual designs include moderate soils cutting at existing the sports field and parking garage. To better meet the site program, a parking deck is proposed beneath the sports field.

TRAFFIC IMPACTS & ACCESS:

The existing Doherty site is limited to access from Highland Street only, which has limitations, and is subject to traffic congestion. Refer to Section 3.3.3.D.1 for an updated traffic analysis.

BUS & PARENT VEHICULAR CIRCULATION & PARKING:

This option provides a dedicated loop for buses in front of the main entrance to the building along Highland Street, completely separated from the parent and staff vehicular traffic. All vehicular access is from Highland Street, adding to traffic flow complexities. In order to achieve the required student parking, a decked parking area below the athletic fields is included in the cost estimate. The parking deck represents a moderate cost and some security/surveillance issues. Perimeter access around the building for emergency vehicles is provided per requirements.

CONSTRUCTION SCHEDULE IMPACT:

With the phased construction, the building is anticipated to meet the current occupancy goal of Fall 2024, however the fields and parking deck will not be completed and available for use until the following year. Early bid packages are anticipated as follows:

- Design Development Submission and Site Enabling Bid Package
- 60% Construction Document Submission and Early Site Work Bid Package
- 90% Construction Document Submission and Early Concrete and Steel Bid Package

The conceptual project phasing at the time of this report is as follows:

ENABLING SITEWORK PACKAGE (06/2021 to 9/2021):

- Mobilize on site; Install temporary retaining walls at Highland Street, excavation and slope mitigation at the rear of the existing school. Regrade and install paving around the building; create fenced dedicated construction access driveway to the east of existing building; excavate and prepare the northeast corner of the property as CM/Subcontractor area for temporary facilities, storage, parking, etc.

PHASE 1 (10/2018 to 6/2024):

- Mobilize on site; create fenced dedicated construction access driveway around the west of the existing building; prepare northernmost lower parking lot as CM/Subcontractor area for temporary facilities, storage, parking, etc.
- Perform early sitework scope including site prep for new building, new utilities, construction access, new parking lots and perimeter driveway (Early bid packages are anticipated for Site Work, Concrete and Steel.
- Construct new building

PHASE 2 (6/2024 to 9/2024):

- Abate hazardous materials and demolish existing part of existing school, beginning with the areas closest to the new building (Gymnasium, ETA, Music, Auditorium and Classrooms)
- Perform sitework scope including new staff parking and driveways at main entry
- Receive and install FF&E
- Occupy existing building for the 2024 school year.

PHASE 3 (9/2024 to 9/2025):

- Perform remaining sitework scope including new parking deck with elevated synthetic field, bleachers and outdoor toilet building, finish paving, landscaping and other site improvements
- Demobilize

ADJACENT USES & NEIGHBORHOOD IMPACT:

The existing school is an established location, so impact on the neighborhood is expected to be limited primarily to construction related activities, with a minor increase of traffic due to the added enrollment. The southern portion of the site that is currently undeveloped is used by the Newton Hill parks programs, disc golf, trails, and buffer land. The project development must be very sensitive to the adjacent park land, and has had discussions with the Friends of Newton Hill throughout the PSR phase to discuss ways that the school project can be mutually beneficial to the park. Possible solutions discussed include improvement of trails on newton hill, provision of parking spaces for access to the park after hours, green retaining walls and other facility improvements.

Historical Elm park is also across Park Avenue to the east, which represents opportunities for views and visual connections.

UTILITIES & DEVELOPMENT ISSUES:

Utilities are available and adequate. Refer to the Civil Basis of Design narrative in Section 3.3.3.D.1.

ADDITIONAL CITY COSTS (NOT ELIGIBLE FOR MSBA REIMBURSEMENT)

LPA|A reviewed opportunities to supplement Doherty's athletic fields, both during construction and after completion. One option for expansion is the addition of a rectangular football/soccer/field hockey field at adjacent to the existing Duffy Softball Field. Other City may include offsite improvements for traffic management and pedestrian crosswalks.

Other option City costs include:

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- Newton Hill trail improvements
- Improved Access to Foley Field (land cost of rear land of three Abbott Street parcels)
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- Foley Stadium Improvements to Rear Fields

The total added city costs for this Option would range between $6–11 Million. Refer to Section 3.3.3.D.3 Offsite improvements for more information.

NEW CONSTRUCTION SCOPE OF WORK:

Site:

Provide full site accessibility to comply with 521 CMR including:

- Provide an accessible route, via new sidewalks ramps, and curb cuts, from Highland Street
- Refer to Civil and Traffic Basis of Design narratives in Section 3.3.3.D.1.

Building Exterior/Interior:

- Refer to the Architectural Basis of Design Narrative in Section 3.3.3.D.1.

Sustainability / Net Zero Energy Goal:

- Provide infrastructure required for sustainable building project, and net zero energy goals
- The City / School Facilities departments have developed a list of preferred systems and equipment choices that are maintainable, durable and efficient, and updates their list with newer equipment as systems come on the market.
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Hazardous Materials:

- Abate entire existing building prior to demolition
- Provide radon mitigation system at Lower Level slab-on-grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:

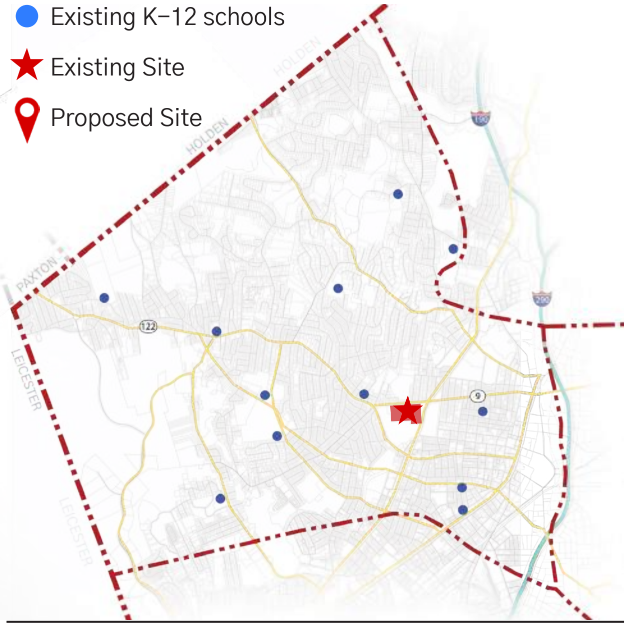
- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

Food Services:

- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.

NOTES:

QUADRANT KEY PLAN:



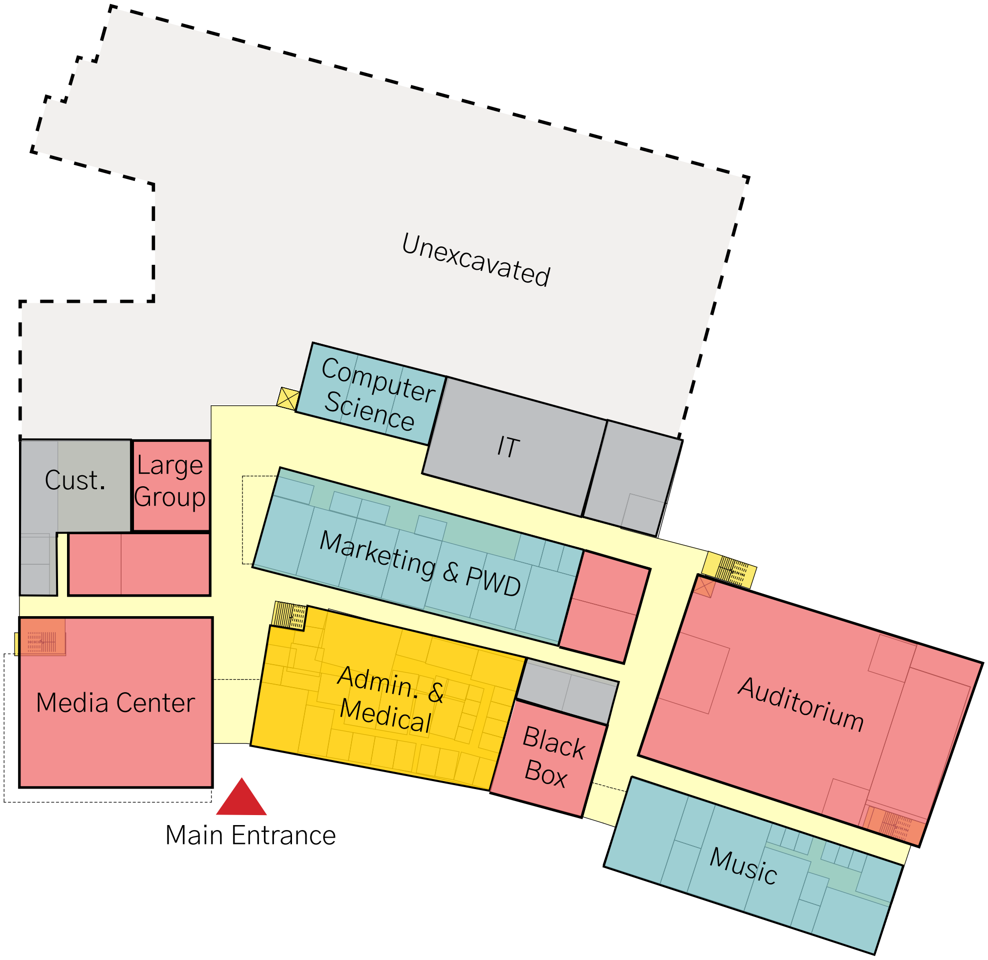
LEGEND:

Parcel Property Line	New Roadway
Potential acquisition	Bus Circulation
New Construction	Parent Circulation
New Athletic Field	Connection
Existing Building	Utility
Flood Plain	
Wetland	
Retaining Wall	
Steep Topography	
Entrance	

N

0' 50' 100' 200'

LPA|A



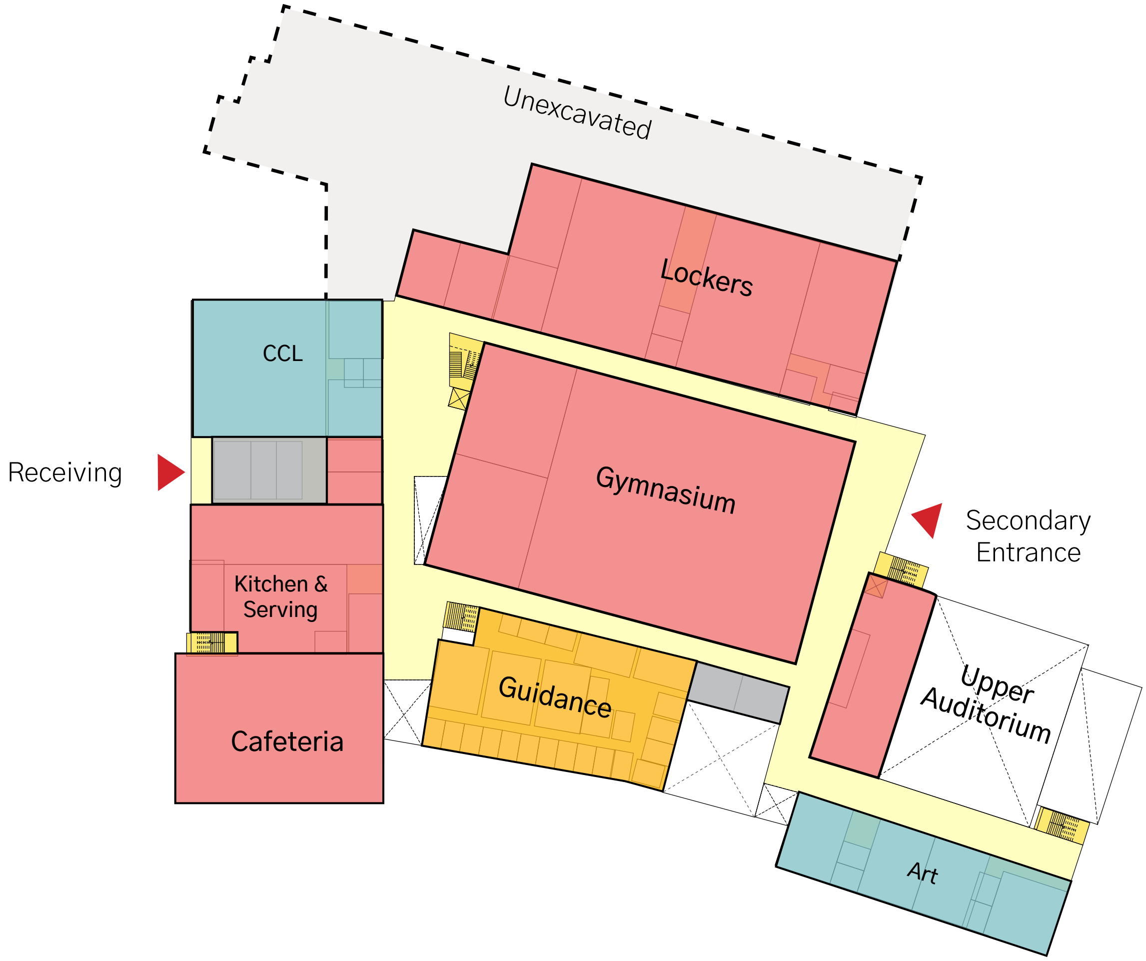
FIRST FLOOR

1"=100'

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ▨ BUILDING SERVICE
- ⬜ CIRCULATION

N



SECOND FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ▩ BUILDING SERVICE
- ▢ CIRCULATION

N

THIRD FLOOR
1”=100’

LEGEND

🟥 CORE FACILITY

🟦 ACADEMIC

🟨 ADMINISTRATION

▩ BUILDING SERVICE

⬜ CIRCULATION

N

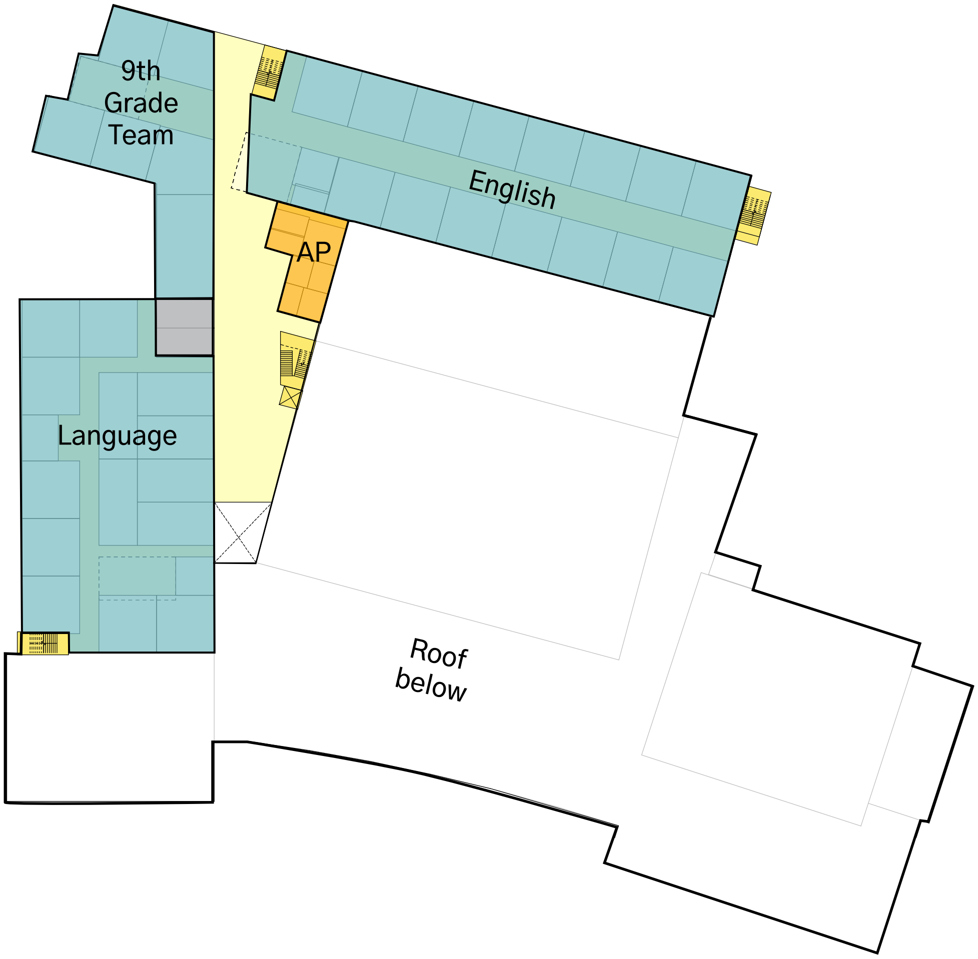
FOURTH FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY
🟦 ACADEMIC
🟨 ADMINISTRATION
▨ BUILDING SERVICE
⬜ CIRCULATION

N



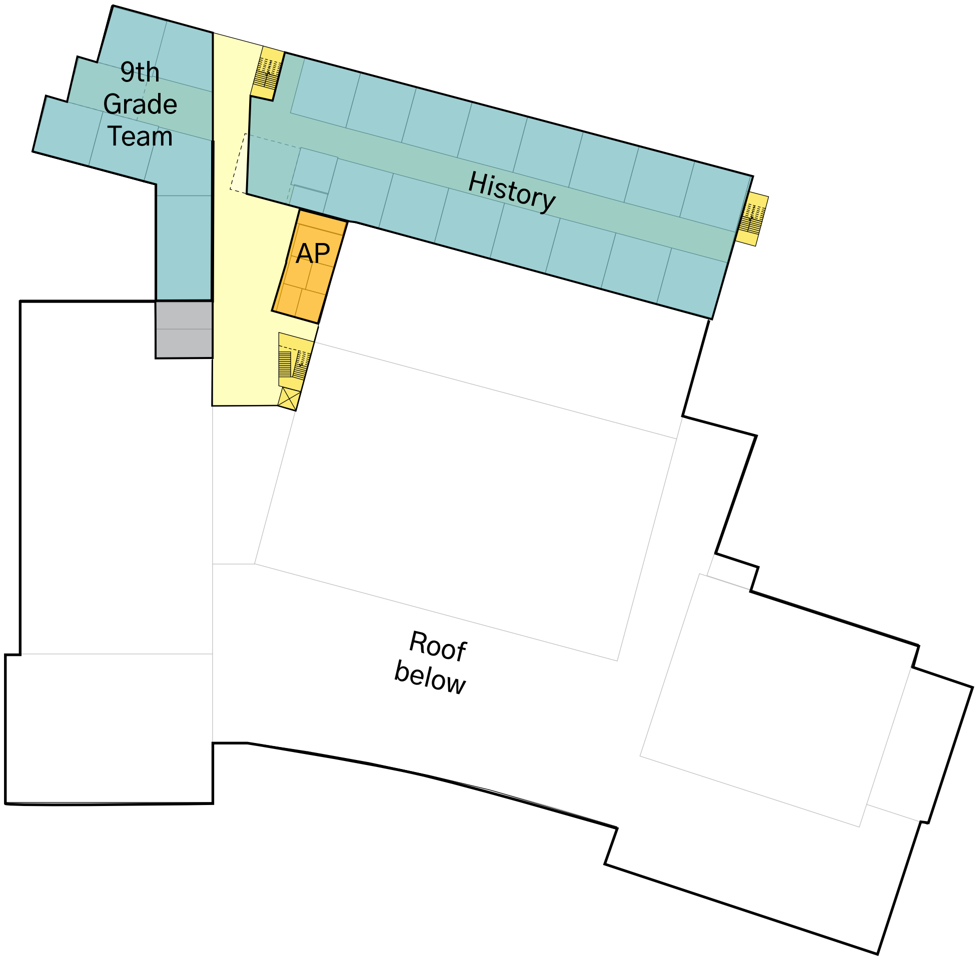
FIFTH FLOOR

1”=100’

LEGEND

🟥	CORE FACILITY
🟦	ACADEMIC
🟨	ADMINISTRATION
▨	BUILDING SERVICE
⬜	CIRCULATION

N



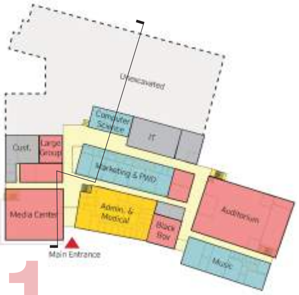
SIXTH FLOOR

1”=100’

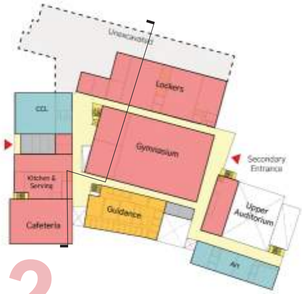
LEGEND

N

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- 🟨 CIRCULATION


Unexcavated
Computer Science
IT
Cust.
Large Group
Marketing & PWD
Media Center
Admin. & Medical
Black Box
Auditorium
Music
Main Entrance

1


Unexcavated
Lockers
CCL
Gymnasium
Secondary Entrance
Kitchen & Serving
Cafeteria
Guidance
Upper Auditorium
Art

2


Life Skills & ETA Entrance
9th Grade Team
ETA & 9th Grade Team
AP
50% Science
Gymnasium below
Cafeteria below
Roof below

3


9th Grade Team
Math
AP
50% Science
Roof below

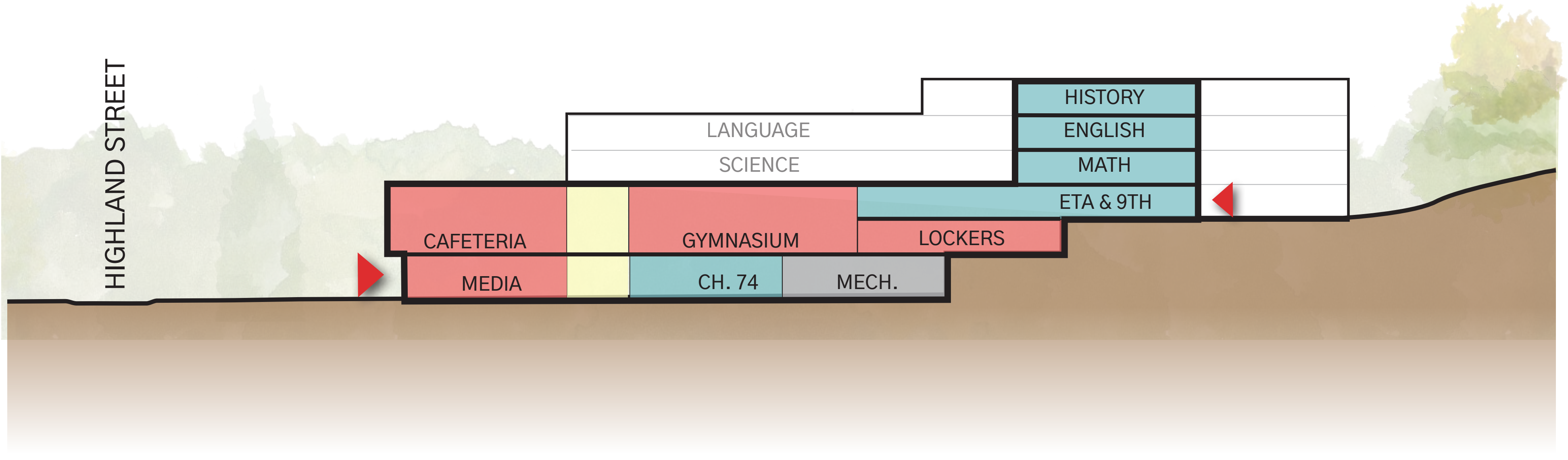
4


9th Grade Team
English
AP
Language
Roof below

5


9th Grade Team
History
AP
Roof below

6


HIGHLAND STREET
HISTORY
ENGLISH
LANGUAGE
SCIENCE
MATH
ETA & 9TH
CAFETERIA
GYMNASIUM
LOCKERS
MEDIA
CH. 74
MECH.


FOLEY STADIUM
Beaver Brook
PLEASANT STREET
NEWTON HILL
AT ELM PARK
PARK AVENUE
HIGHLAND STREET

3.3.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options

6. Option B.1 New Construction on Foley Site

a. Narrative
b. Site Plan
c. Floor Plans
d. Massing

SUMMARY: This New Construction Option is based on a new building located on the 50 Abbott Street site with significant frontage on Chandler Street. This 14-acre flat, developed, site is owned by the Worcester Public School district and currently houses district's General Foley Stadium, Commerce Bank Field, several practice fields and storage, all of which are utilized by the entire school district.

The existing facilities consists of:

- Stadium seating for 2500 spectators (typical capacity 1500 spectators)
- Locker rooms for coaches & staff
- Locker rooms for visiting and home teams
- Office & medical area
- Maintenance and storage facilities (6000sf)
- Synthetic track, artificial turf football/soccer/field hockey field and amenities (shot put, jump etc.), w/ outdoor lighting
- Full baseball field, w/ dugouts, bleachers (flat field overlay at outfield)
- Two flat fields, lacrosse, field/hockey/soccer
- Practice fields, athletic events area
- Parking for 60 staff, bus parking, outdoor storage/maintenance facilities
    - 150 parking spaces across the street and 27 spaces on Mayfield street are jointly used with Beaver Brook Park

Track and field upgrades and building painting upgrades were completed by the district in 2018, totaling an investment of approximately $685,000.

The Foley Stadium facilities are used district-wide by all of the high schools as well as other schools in the city. Thirty-eight teams with over 1,000 participants practice and compete at the fields annually. During the outdoor athletic season, the facility and fields are heavily scheduled after school and evenings as well as weekends. Foley Stadium has the only competitive track in the entire district at this time. Due to the facility's significant use, any new construction option would need to take into consideration replacement of the existing amenities.

Maintained and operated by the Worcester Parks Department, the adjacent Beaver Brook fields are used by WPS and by various community leagues use, and are also extensively scheduled in the afternoons, nights and weekends.

The existing Beaver Brook Park consists of:

- Street Hockey Rink with bleachers

- Youth football field with bleachers
- Regulation softball field with dugouts and bleachers
- Little league baseball field with dugouts and bleachers
- Little league baseball field with dugouts and bleachers
- Softball with flat field overlay (grass infield) with dugouts and bleachers
- Lighting at all the fields
- 150 parking spaces, jointly used by Foley Stadium
- 27 parking spaces on Mayfield Street, jointly used by Foley Stadium
- Basketball courts,
- Playground
- Dog park
- Parking
- A network of trails, accessways and landscaping
- All fields were updated in 2005 ($5.6 Million Construction Cost)
- All the fields and items have been designed to be as close to each other as practical, there is little to no availability to expand

Relocation of all the Foley facilities to Beaver Brook is not a viable option for many reasons. First the area is in a flood zone, which is suitable for general fields, but not recommended for expensive synthetic fields, a urethane track, or extensively used fields that require extensive underdrains allowing for tightly scheduled usage. Second, the received soils test borings indicate extensive peat, silt and unsuitable subgrade material, that is suitable for general fields, but is also not suitable for expensive synthetic fields or tracks due to potential uneven settlement. Third, the Beaver Brook fields suitable for High School use are presently jointly used with the school district. The smaller fields are dedicated to the Little Leagues, and not suitable for high school use, but desirable for community group use. The Parks Department considers the fields as an important community resource, and are open to any joint expansion schemes, or joint scheduling options, that would work with the community park purpose.

BUILDING ORGANIZATION:

Option B.1 is organized with a central circulation spine with academic pods to the North toward Chandler Street, and core academic areas to the South toward the residential areas. The building is organized into a total of 5 levels. As the Foley Stadium site is a flat, previously developed site, grade access is provided at the Main Entrance, the Gymnasium, and the receiving area. The academic pods are flexible to allow Academic departments to be organized on two floors vertically (with opportunities for vertical common rooms) or in two adjacent pods on the same floor. Given this organization, access control between community and academic would be developed at the pod entrances. The pod configuration provides great opportunities for daylight to each classroom. The prominent two-story entrance lobby intersects the strong circulation spine, providing clarity of circulation and organization. The massing along Chandler Street would feature the main entrance as well as the active core and community use spaces.

OPTION ANALYSIS:

Proposed SF areas for this option are approximately as follows:

▪ **New Construction**	**= 420,000 GSF**
▪ **Demolition (existing toilets/lockers, grandstand and storage)**	**= 187,136 GSF**

ABILITY TO MEET BUILDING PROGRAM:

This New Construction Option satisfies most if not all Educational Program/Space Summary objectives. Compared to the other options, Option B.1 provides similar opportunities for daylighting as Option A.1 Pods on Park. The building layout features clear and understandable pod organization off of a two-story lobby/entrance. As this option is located on a flat, developed site, the Gymnasium, Cafeteria, Auditorium and Black Box are all located on the same level as the main entrance.

ACQUISITION ISSUES:

The Site is owned by Worcester Public schools, however the site plan for this option includes the acquisition of rear land from three parcels. Acquisition of this added land would be required in order to meet the desired parking requirements, and would allow for a connection to the site via Norman Avenue.

COMPARATIVE STAFF AND STUDENT IMPACT:

Because a new building can be constructed on a site entirely separate from the existing building (which can remain fully occupied), the New Construction on Alternate Site options will have the least impact to Doherty students than on any option on the existing site, and all without the need for “swing space”. The biggest impacts include the following:

- Loss of existing building and site features unique to the alternate site (in this case, the Foley Stadium and associated practice fields). As a District wide facility, it would be important to have a replacement for the facility prior to construction of the new school facility.

ABILITY TO MEET SITE ATHLETICS PROGRAM:

While the program ideally would have all the desired fields on the same site, limited field development is anticipated for this option. The site plan for this option shows that the athletic fields proposed on this site plan would be limited to a single practice soccer/field hockey field. While this field could be designed with synthetic turf and lighting for extended use, the district would lose the facilities that are currently located at the Foley stadium site. According to the district, these amenities (including a turf football field with track, bleachers and support building, a field hockey field, a soccer field, two rectangular practice fields, a baseball field, parking and storage) would need to be re-constructed (a significant cost to the City) at an alternative site prior to construction of DMHS in order to avoid major disruption of the district's athletics programs.

CENTRAL TO DISTRICT/QUADRANT:

The Foley Stadium site is relatively central to the district, especially with access to major feeder routes.

SITE DEVELOPMENT COSTS:

The Soils logs provided as reported under the Geotechnical review noted that the parcel is filled with a mix of urban fill, and coal ash. A system of piles foundations at a premium cost would be anticipated to support any structure on the site.

TRAFFIC IMPACTS & ACCESS:

This option would include several curb cuts along Chandler Street, as well as a potential access to Abbott Street or Coombs Road. Initial studies of traffic data indicate that constructing the new Doherty Memorial High School on this site would result in "significant additional vehicular congestion at Chandler Street." Refer to Section 3.3.3.D.1 for an updated traffic analysis. Should this option be selected, further studies would be required to determine mitigating measures required to address. The team has discussed with the district and budgets were suggested for potential measures that are to be considered with their overall reviews of the options.

BUS & PARENT VEHICULAR CIRCULATION & PARKING:

Bus and parent circulation are separated in this option. The desired number of parking spaces may be accomplished with the acquisition of additional land from Abbot Street abutters. Refer to the Civil Basis of Design Narrative

CONSTRUCTION SCHEDULE IMPACT:

One advantage of New Construction on an Alternative site is that it doesn't have the limitations, in terms of work area, as any option on the existing school site. The entire site is free for development. More workers can be productive because there is a greater area to work in. Consequently, the duration of the project can be less than a project which has numerous phases, relocations, and temporary support facilities. There will be more efficiency realized when compared against building on an active school site.

ADJACENT USES & NEIGHBORHOOD IMPACT:
Foley Stadium is a long-standing public facility, the parcel backs up to the surrounding residential neighborhood. The building would be positioned fronting Chandler Street, and parking and fields would be adjacent to the residences. Buffers could be established to minimize the impact to the neighbors. The hours of operation for a high school also differ from those of a stadium, the impact of which would need to be evaluated further if selected as the preferred solution.

UTILITIES & DEVELOPMENT ISSUES:
Beaver Brook runs in a conduit though the site, and is assumed to be original to the site development in the 1920's. This 84" conduit would have to be relocated around the building, and also be supported on ground improvements or piles. Additionally, a significant stormwater management system would be required to address the increased impervious site cover. Refer to the Civil Basis of Design narrative in Section 3.3.3.D.1.

ADDITIONAL CITY COSTS (NOT ELIGIBLE FOR MSBA REIMBURSEMENT):
If the Foley Stadium site was chosen as the location for the new Doherty Memorial High School, the City and school district would need to invest in a capital project that would replace Foley Stadium and the associated buildings and fields, prior to the start of construction. Initial cost estimates indicate that the cost to purchase land and build a replacement stadium would be approximately $35-40 Million.

The site plan indicates acquisition of rear land from three parcels along Abbott Street. If this option was selected the City would utilize the Eminent Domain process to acquire the added land indicated on the site plan. The cost of the added land is estimated at $682,500.

At project completion, existing Doherty school facility would be vacant, and the City would need to fund the required next steps to either renovate or demolish the existing Doherty High School Building. The approximate budget for demolition of the existing building is $5 million.

Optional costs may include improvements for traffic management and pedestrian crosswalks. In order to replicate the number of practice and game fields eliminated, the City may also consider Beaver Brook drainage improvements, and the development of additional flat fields behind Chandler Manet School.

The total added City costs for this Option would range between $50–60 Million. Refer to Section 3.3.3.D.3 Offsite Improvements for more information.

NEW CONSTRUCTION SCOPE OF WORK:

Site:

Provide full site accessibility to comply with 521 CMR including:

- Provide an accessible route, via new sidewalks ramps, and curb cuts, from Highland Street
- Refer to Civil and Traffic Basis of Design narratives in Section 3.3.3.D.1.

Building Exterior/Interior:

- Refer to the Architectural Basis of Design Narrative in Section 3.3.3.D.1.

Sustainability / Net Zero Energy Goal:

- Provide infrastructure required for sustainable building project, and net zero energy goals
- The City / School Facilities departments have developed a list of preferred systems and equipment choices that are maintainable, durable and efficient, and updates their list with newer equipment as systems come on the market.
- A design charrette will be scheduled early in the design process to solicit input and priorities in an effort to determine the best strategies for this project. The Sustainable Design consultant and MEP consultants will attend and present new energy saving strategies for consideration.
- One approach used in the past that would be continued on this project are to maximize the R value of the building envelope, including components such as windows and doors.
- Refer to the MEP narratives for additional information.

Fixtures, Furnishings & Equipment (FF&E)/Technology:

- Provide new FF&E throughout including furnishings, equipment, maintenance items, etc.
- Provide new Technology throughout including student/teacher computers, mobile device charging carts, interactive projectors, servers, etc.

Hazardous Materials:

- Abate entire existing building prior to demolition
- Provide radon mitigation system at Lower Level slab-on-grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:
- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:
- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:
- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

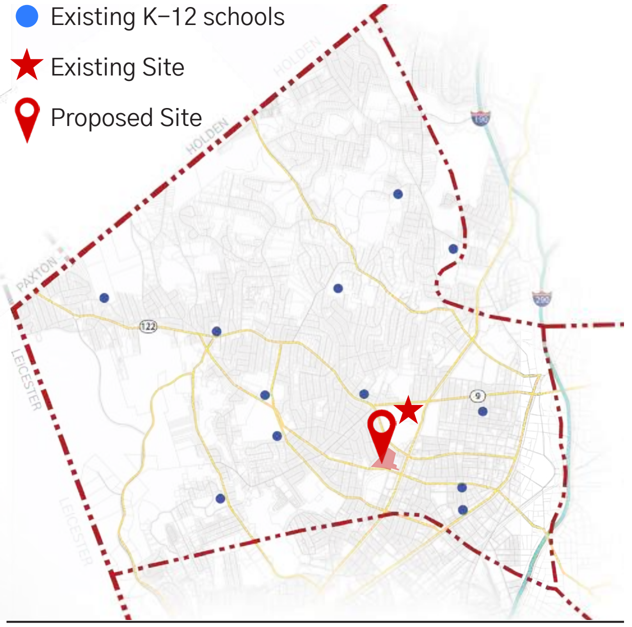
Food Services:
- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.

NOTES:

- Flat, developed site
- Unsuitable soil conditions
- Beaver Brook culvert
- Beaver Brook Park, not regulation size fields
- Recently refurbished Foley Stadium is heavily used by the district and community

QUADRANT KEY PLAN:

- ● Existing K–12 schools
- ★ Existing Site
- 📍 Proposed Site



LEGEND:

- Parcel Property Line
- Potential acquisition
- New Construction
- New Athletic Field
- Existing Building
- Flood Plain
- Wetland
- Retaining Wall
- Steep Topography
- ▲ Entrance
- New Roadway
- Bus Circulation
- Parent Circulation
- Connection
- Utility

N

0' 50' 100' 200'

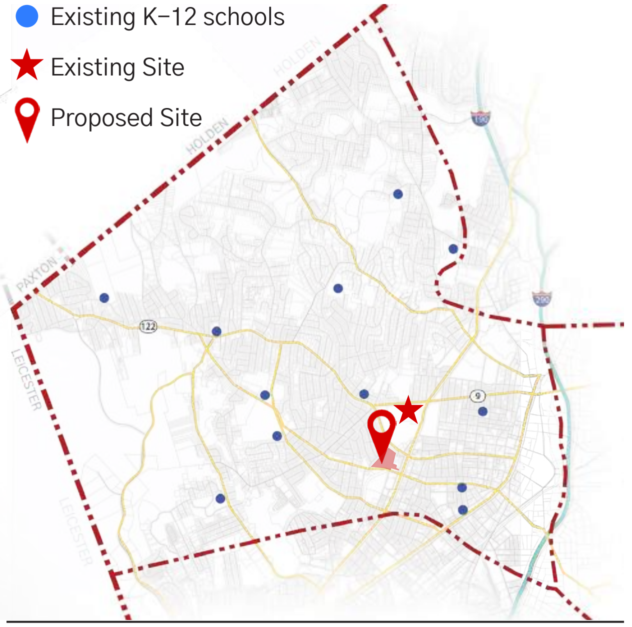
LPA|A

NOTES:

- Building will require pile foundations
- Optional Land Acquisition to add 50 parking spaces and access via Norman Ave.
- Loss of Foley Stadium would impact district athletics
- Traffic and neighborhood impacts
- Relocation of Beaver Brook Culvert

QUADRANT KEY PLAN:

● Existing K–12 schools
★ Existing Site
Proposed Site



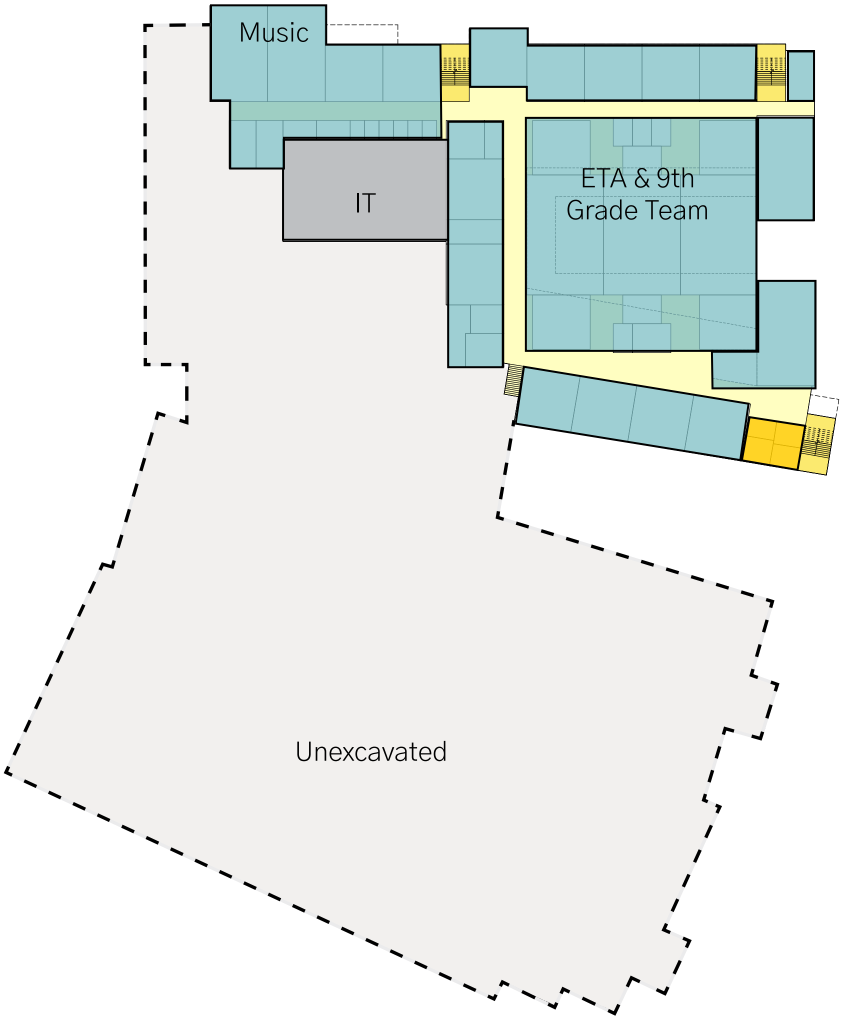
LEGEND:

Parcel Property Line
Potential acquisition
New Construction
New Athletic Field
Existing Building
Flood Plain
Wetland
Retaining Wall
Steep Topography
Entrance
New Roadway
Bus Circulation
Parent Circulation
Connection
Utility

N

0' 50' 100' 200'

LPA|A



FIRST FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY

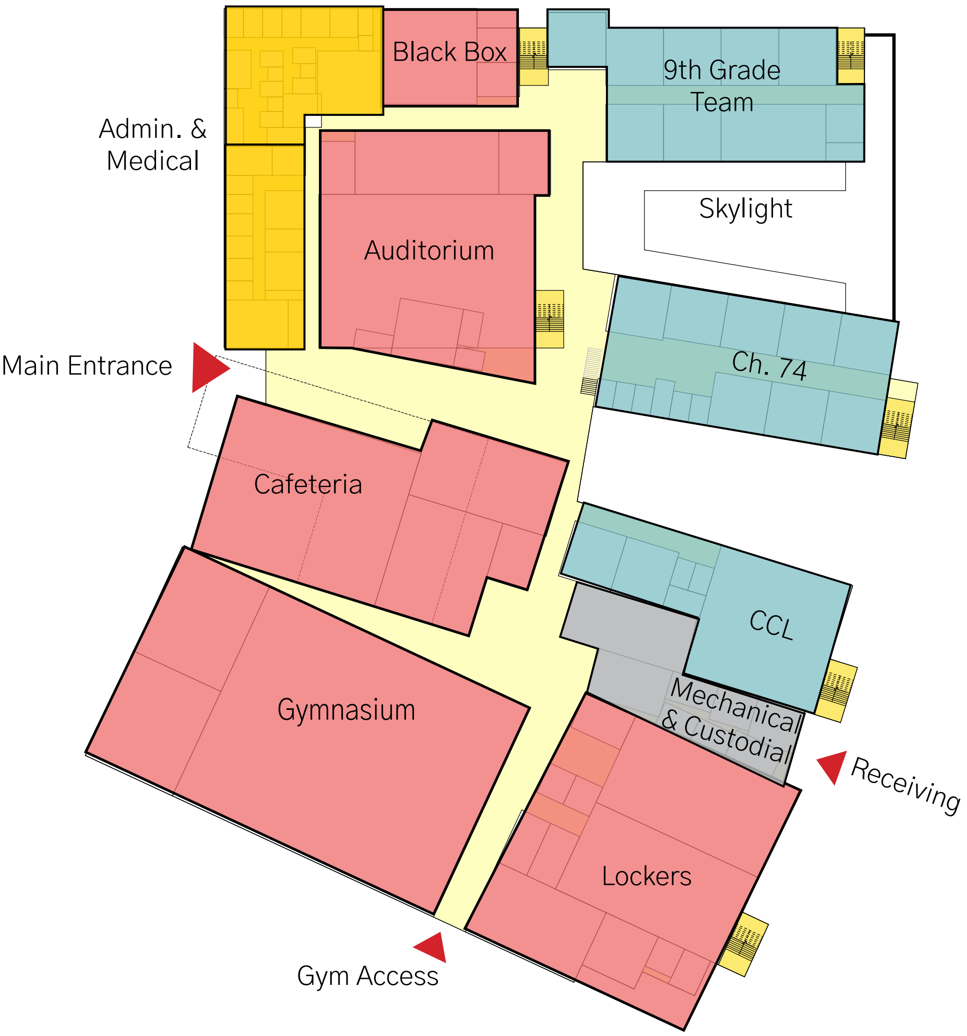
🟦 ACADEMIC

🟨 ADMINISTRATION

⬜ BUILDING SERVICE

🟨 CIRCULATION

N



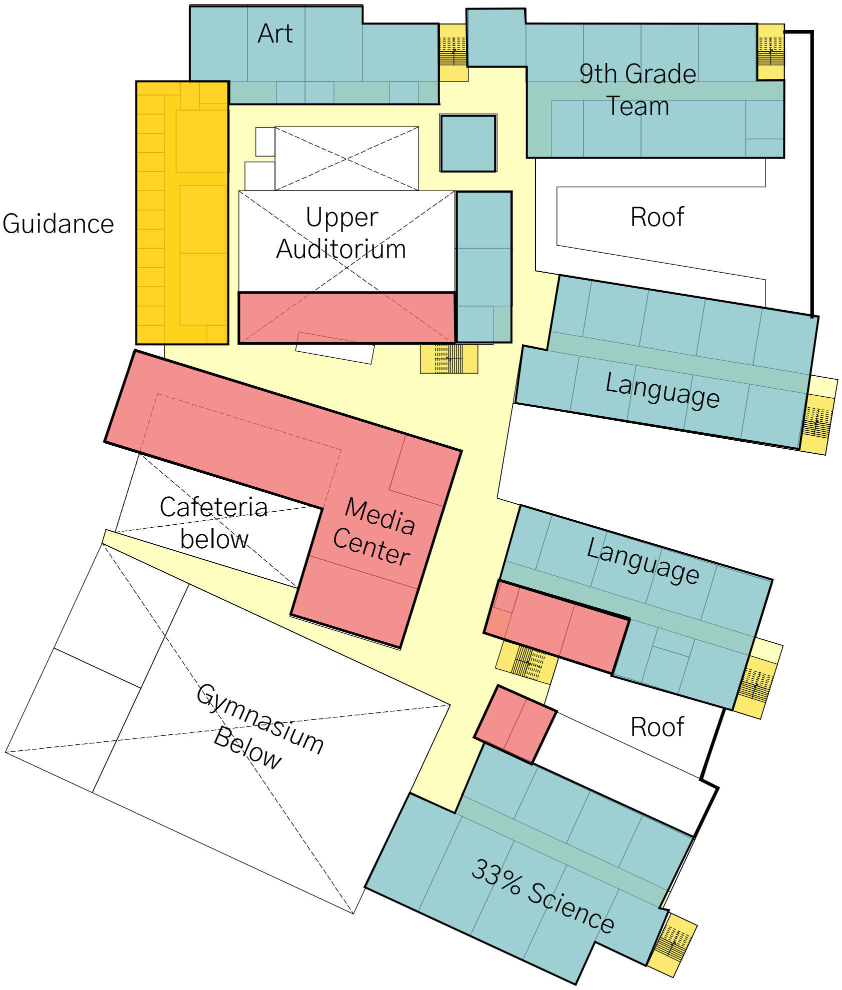
SECOND FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY
🟦 ACADEMIC
🟨 ADMINISTRATION
▨ BUILDING SERVICE
⬜ CIRCULATION

N



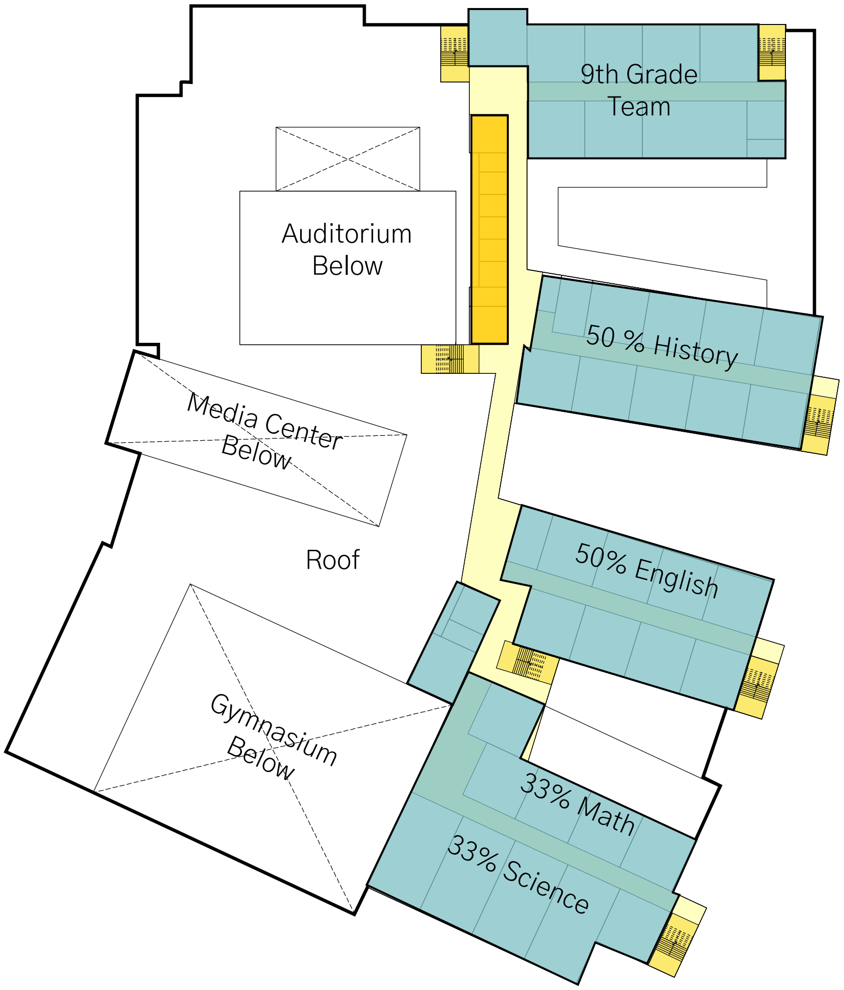
THIRD FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N



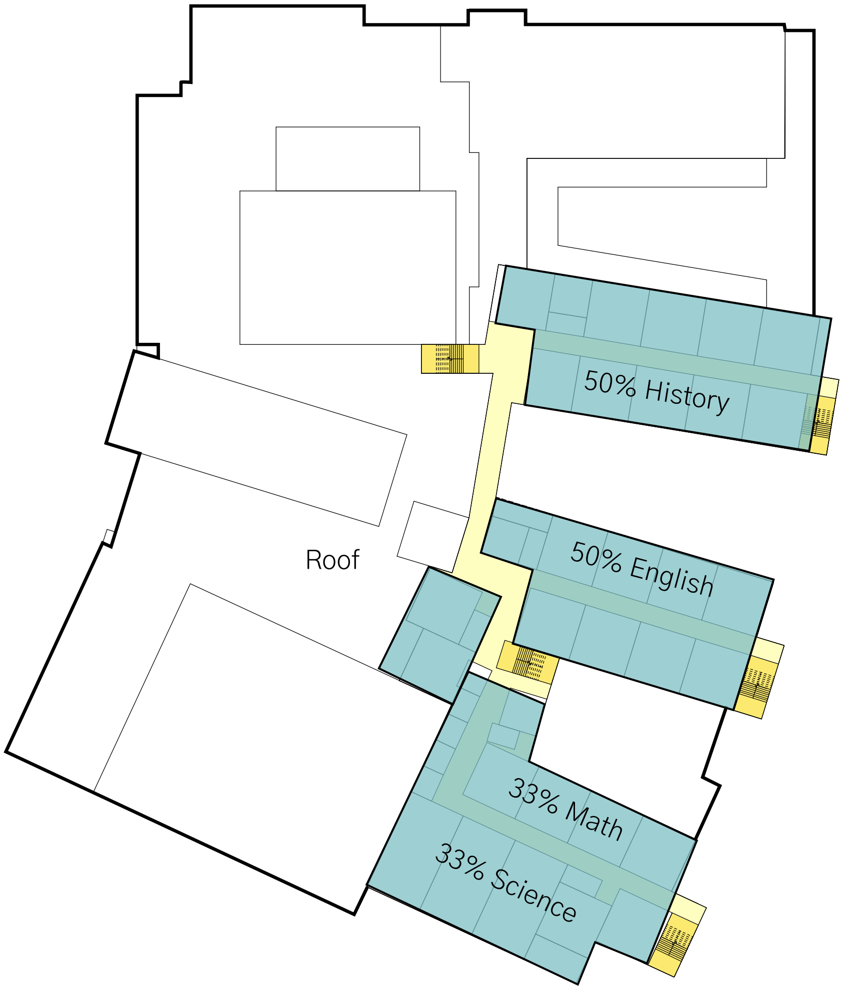
FOURTH FLOOR

1”=100’

LEGEND

- 🟥 CORE FACILITY
- 🟦 ACADEMIC
- 🟨 ADMINISTRATION
- ⬜ BUILDING SERVICE
- ⬜ CIRCULATION

N



FIFTH FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY

🟦 ACADEMIC

🟨 ADMINISTRATION

⬛ BUILDING SERVICE

⬜ CIRCULATION

N

3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
6. Option B.1 New Construction on Foley Stadium Site
d. Massing View

Doherty Memorial High School
299 Highland Street, Worcester MA

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3.3.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options

7. Option C.2 New Construction on Chandler Magnet School Site with Added Land

a. Narrative
b. Site Plan
c. Floor Plans
d. Massing

SUMMARY: This New Construction Option is based on a new building located on the 525 Chandler Street site. This 22 Acre site is owned by the Worcester Public School district and contains the existing Chandler Magnet School building, a practice field and softball field. The school currently has an enrollment of approximately 500 students, which includes the district's elementary dual language and bilingual programs.

BUILDING ORGANIZATION:

The building in Option C.2 is organized into four levels, with a large central atrium connecting the main entrance with the Gymnasium, Cafeteria, Auditorium and Media Center, located one floor above the main entrance. The building is built into the existing topography of the site, providing grade access at the main entrance, and a secondary entrance at the rear of the site, providing convenient access to parking and the athletic fields from the gymnasium and cafeteria. Organization and separation of the academic wings is intuitive and organized with the desired adjacencies. Separation of the academic spaces from the community use spaces would occur at the corridors accessing the large central lobby.

OPTION ANALYSIS:

Proposed SF areas for this option are approximately as follows:

- **New Construction = 420,000 GSF**
- **Demolition (existing building) = 102,000 GSF**

ABILITY TO MEET BUILDING PROGRAM:

This New Construction Option satisfies most if not all Educational Program/Space Summary objectives. While the majority of teaching spaces have access to natural daylight and views, the terracing of the building into the existing site does result in some interior classrooms, primarily Chapter 74 labs and computer labs.

ACQUISITION ISSUES:

The Chandler Magnet Street site is owned by Worcester Public Schools; however, the restrictive parcel shape of this property requires the acquisition of neighboring land in order to appropriately address the educational program. This option proposes land acquisition from adjacent parcels owned by Worcester State Foundation Real Estate LLC, and rear land acquisition from May Street Residences.

COMPARATIVE STAFF AND STUDENT IMPACT:

Because a new building can be constructed on a site entirely separate from the existing Doherty Memorial High School building, the New Construction on Alternate Site options will have the least impact to Doherty students than on any option on the existing site, and all without the need for “swing space”. The biggest impacts include the following:

- Loss of existing building and site features unique to the alternate site (in this case, the existing Chandler Magnet School building). The district has advised that since there is no facility that can accommodate the full Chandler Magnet School population. Without a capital plan for replacement of the school, the option to develop the site for the replacement high school is not viable.

ABILITY TO MEET SITE ATHLETICS PROGRAM

While the proposed athletic fields would not fully meet the program, this option provides comparatively more athletic fields than the other options. The site plan for this option includes a football/soccer/field hockey field, a softball field and a practice field.

CENTRAL TO DISTRICT/QUADRANT:

The Chandler Magnet School site is geographically central to the quadrant.

SITE DEVELOPMENT COSTS:

The Soils test from the original construction, and record information indicate heavy glacial till, and assumed ledge or boulders. Fields and building would have average development issues and related costs with some retaining walls and slope mitigation anticipated.

TRAFFIC IMPACTS & ACCESS:

This option would include several curb cuts along Chandler Street and May Street, as well as a potential access to Moore Avenue. Initial studies of traffic data indicate that constructing the new Doherty Memorial High School on this site would result in significant vehicular and pedestrian congestion at the Chandler Street and May Street intersection. Refer to Section 3.3.3.D.1 for an updated traffic analysis. Should this option be selected, further studies would be required to determine mitigating measures required to address. The team has discussed with the district and budgets were suggested for potential measures that are to be considered with their overall reviews of the options.

BUS & PARENT VEHICULAR CIRCULATION & PARKING:

Bus and parent circulation are separated in this option and the desired number of surface parking spaces are provided. This site has the additional benefit of access to multiple streets, including May

Street, Moore Avenue and Chandler street, reducing on-site traffic conflicts. Refer to the Civil Basis of Design Narrative.

CONSTRUCTION SCHEDULE IMPACT:

One advantage of New Construction on an Alternative site is that it doesn't have the limitations, in terms of work area, as any option on the existing school site. The entire site is free for development. More workers can be productive because there is a greater area to work in. Consequently, the duration of the project can be less than a project which has numerous phases, relocations, and temporary support facilities. There will be more efficiency realized when compared against building on an active school site.

ADJACENT USES & NEIGHBORHOOD IMPACT:

The Chandler Magnet School was originally designed as a middle school 1953. The Worcester State University (WSU) campus is located across Chandler Street, and the areas to the north and east of the site are dense residential neighborhoods. The adjacency to WSU presents opportunities for mutually beneficial educational programs. Landscape or grading buffers could be established to minimize the impact to the neighboring parcels. The hours of operation and enrollment for the Doherty Memorial High School would also increase significantly from that of the existing elementary school, the impact of which would need to be evaluated further if selected as the preferred solution.

UTILITIES & DEVELOPMENT ISSUES:

Existing 10" sanitary pipes and 30"-42" storm drain mains traverse the site in multiple locations (refer to the site plan and the Civil Narrative.) These conduits would need to be re-laid around the building. Otherwise, utilities are available and development is comparable to the other sites.

ADDITIONAL CITY COSTS (NOT ELIGIBLE FOR MSBA REIMBURSEMENT):

If this option was selected as the preferred solution, it is anticipated the City would utilize the Eminent Domain process to acquire the added land indicated on the site plan. The cost of the added land is estimated at $1,575,000.

There will also be some grant repayment costs associated with the MSBA Accelerated Repair window replacement work that was completed in 2013-2014 ($2.8 M total grant).

a. Narrative

At project completion, the existing Doherty school facility would be vacant, and the City would need to fund the required next steps to either renovate or demolish the existing Doherty High School building. The approximate budget for demolition of the existing building and associated site work is $5 million.

Additional City costs would be required for relocation of the existing Chandler Magnet School students within the District if space became available. Without an existing facility for relocation, the District would face significant lease and/or construction costs; no factors for this work are included in the additional costs section. Improvements for traffic management and pedestrian crosswalks are included in the budget. Optional costs may include the purchase of the Abbott Street rear land adjacent to Foley Stadium to improve access an add parking and athletic facilities.

The total added city costs for this Option would range between $9-12 Million. Refer to Section 3.3.3.D.3 Offsite improvements for more information.

NEW CONSTRUCTION SCOPE OF WORK:

Site:

Provide full site accessibility to comply with 521 CMR including:

- Provide an accessible route, via new sidewalks ramps, and curb cuts, from Highland Street
- Refer to Civil and Traffic Basis of Design narratives in Section 3.3.3.D.1.

Building Exterior/Interior:

- Refer to the Architectural Basis of Design Narrative in Section 3.3.3.D.1.

Sustainability / Net Zero Energy Goal:

- Provide infrastructure required for sustainable building project, and net zero energy goals
- The City / School Facilities departments have developed a list of preferred systems and equipment choices that are maintainable, durable and efficient, and updates their list with newer equipment as systems come on the market.
- A design charrette will be scheduled early in the design process to solicit input and priorities in an effort to determine the best strategies for this project. The Sustainable Design consultant and MEP consultants will attend and present new energy saving strategies for consideration.
- One approach used in the past that would be continued on this project are to maximize the R value of the building envelope, including components such as windows and doors.
- Refer to the MEP narratives for additional information.

Fixtures, Furnishings & Equipment (FF&E)/Technology:

- Provide new FF&E throughout including furnishings, equipment, maintenance items, etc.
- Provide new Technology throughout including student/teacher computers, mobile device charging carts, interactive projectors, servers, etc.

Hazardous Materials:

- Abate entire existing building prior to demolition
- Provide radon mitigation system at Lower Level slab-on-grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:

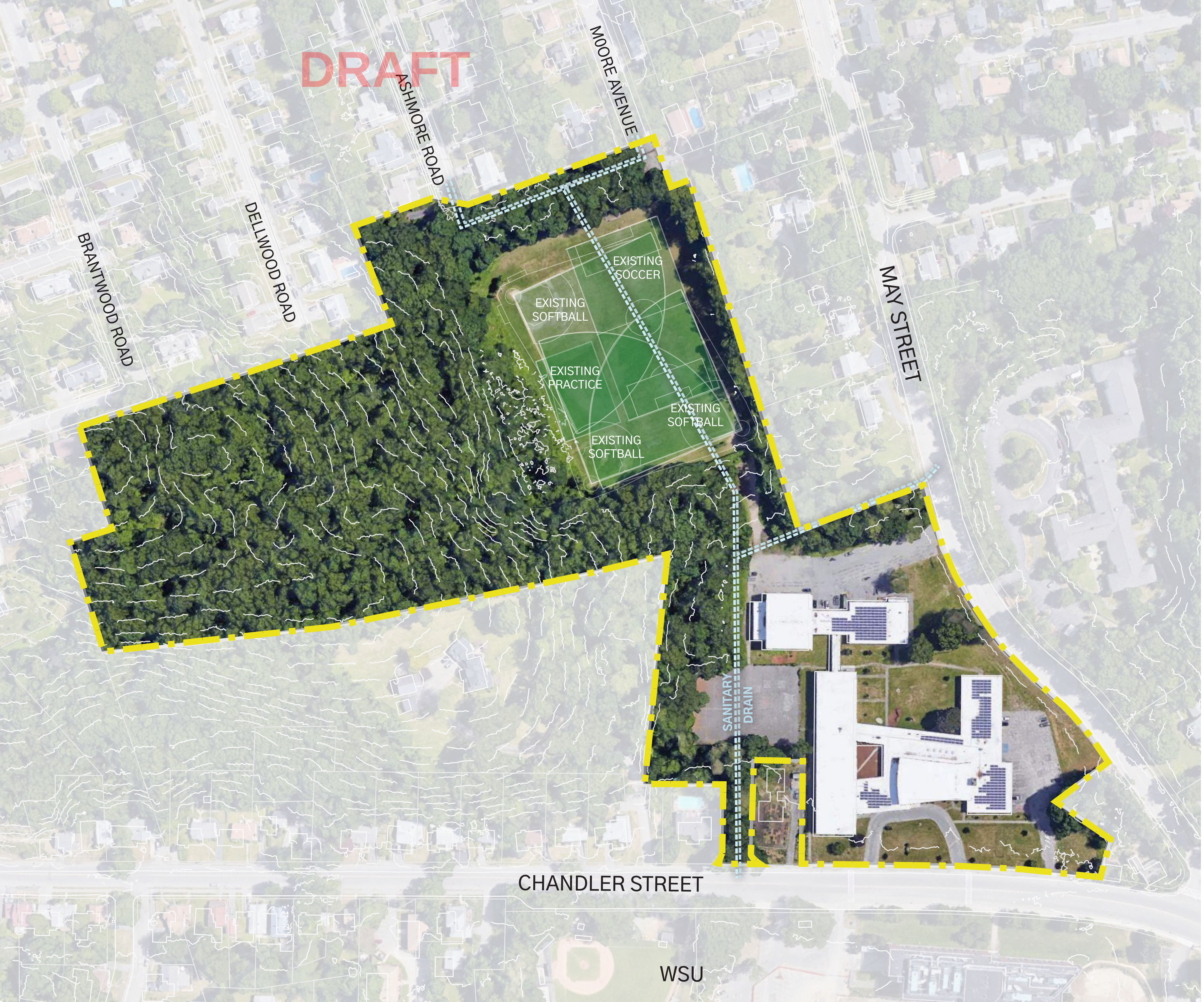
- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:

- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

Food Services:

- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.



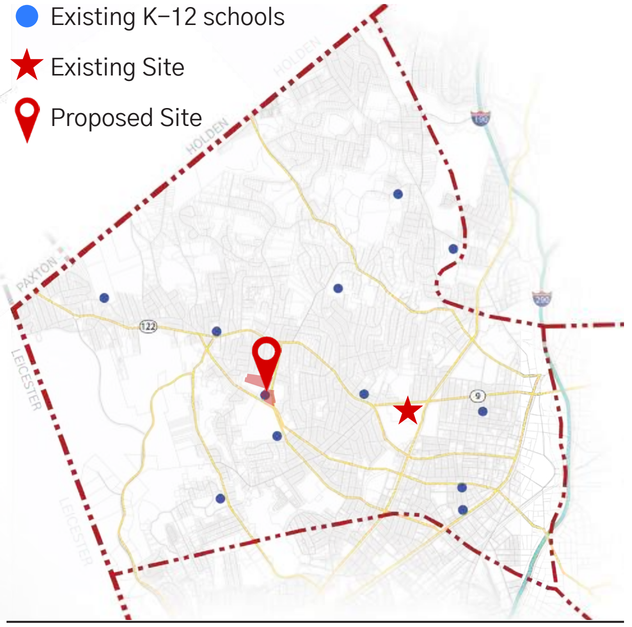
3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
7. Option C.2 New Construction on Chandler Magnet Site
WITH ADDED LAND
b. Existing Site Plan

NOTES:

- Tiered site with steep topography
- Limiting parcel shape
- Multiple access points
- Existing Chandler Magnet school; 1950's school building
- WSU Adjacency

QUADRANT KEY PLAN:

● Existing K–12 schools
★ Existing Site
📍 Proposed Site



LEGEND:

⬚	Parcel Property Line	▬	New Roadway
▨	Potential acquisition	➡	Bus Circulation
🟥	New Construction	• • • ➤	Parent Circulation
🟩	New Athletic Field	‒ ‒ ➤	Connection
⬚	Existing Building	‒ ‒ ‒	Utility
▨	Flood Plain		
▨	Wetland		
▬	Retaining Wall		
▨	Steep Topography		
▲	Entrance		

N

0' 50' 100' 200'

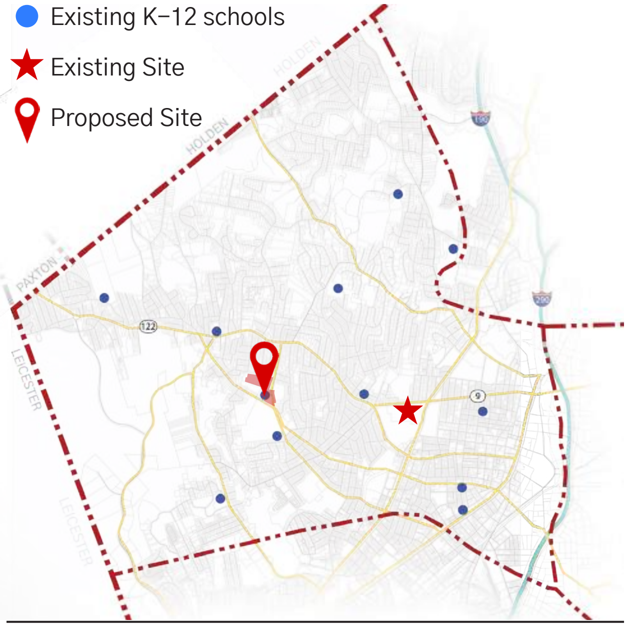
LPA|A

3.3.3 Final Evaluation of Alternatives
C. Preliminary Design Options
7. Option C.2 New Construction on Chandler Magnet Site
WITH ADDED LAND
b. Site Plan

NOTES:

- Land acquisition from Worcester State University LLC and abutters
- Chandler Magnet School closed; programs relocated
- Least impacts to Doherty Students
- Traffic & neighborhood impacts

QUADRANT KEY PLAN:



● Existing K–12 schools
★ Existing Site
📍 Proposed Site

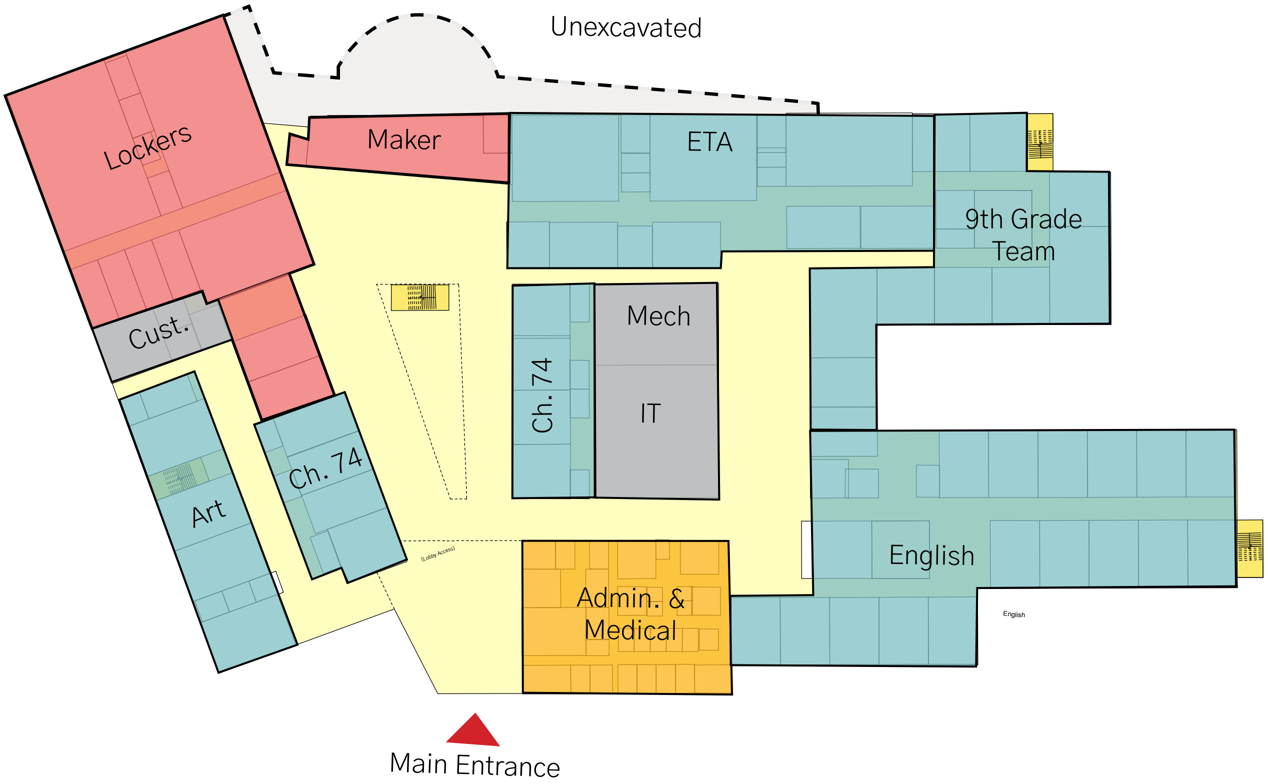
LEGEND:

⬚ Parcel Property Line	▬ New Roadway
▨ Potential acquisition	➡ Bus Circulation
🟥 New Construction	••➤ Parent Circulation
🟩 New Athletic Field	➤ Connection
⬚ Existing Building	▬ Utility
⬚ Flood Plain	
⬚ Wetland	
▬ Retaining Wall	
▨ Steep Topography	
▲ Entrance	

N

0' 50' 100' 200'

LPA|A



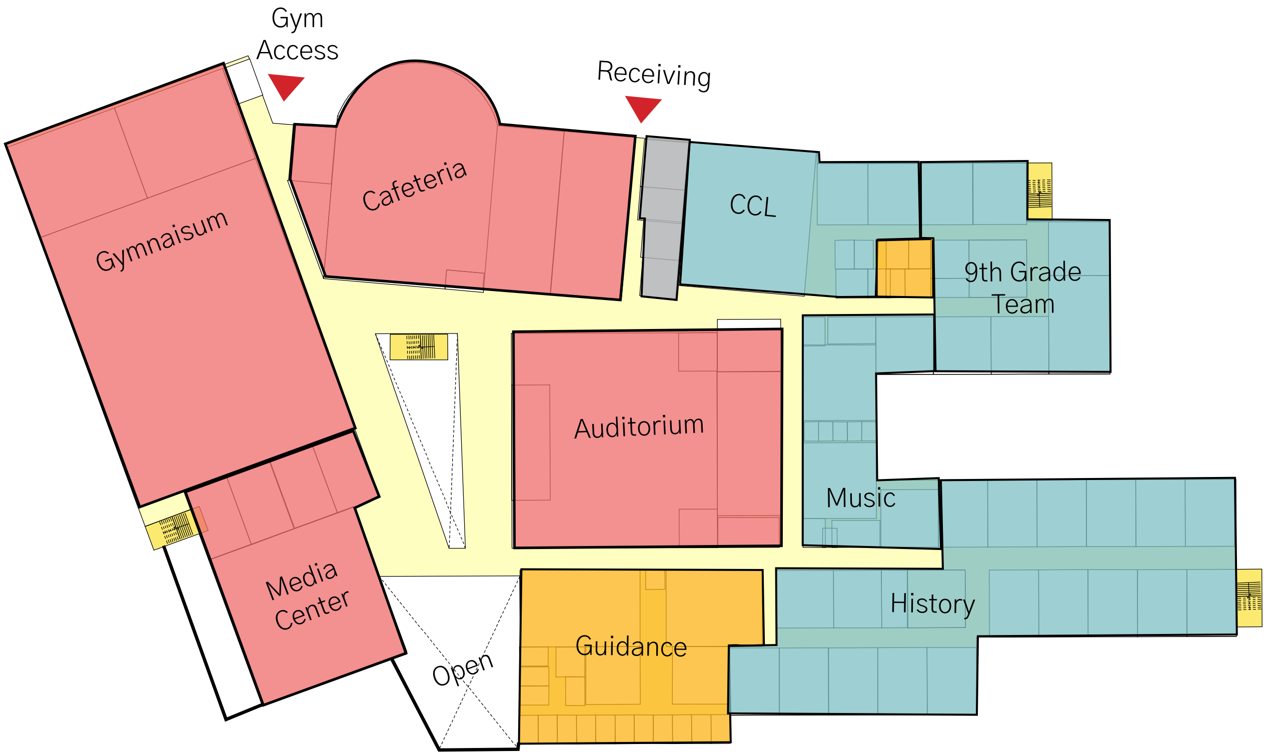
FIRST FLOOR

1”=100’

LEGEND

N

🟥 CORE FACILITY
🟦 ACADEMIC
🟨 ADMINISTRATION
▨ BUILDING SERVICE
⬜ CIRCULATION



SECOND FLOOR

1”=100’

LEGEND

🟥 CORE FACILITY

🟦 ACADEMIC

🟨 ADMINISTRATION

⬜ BUILDING SERVICE

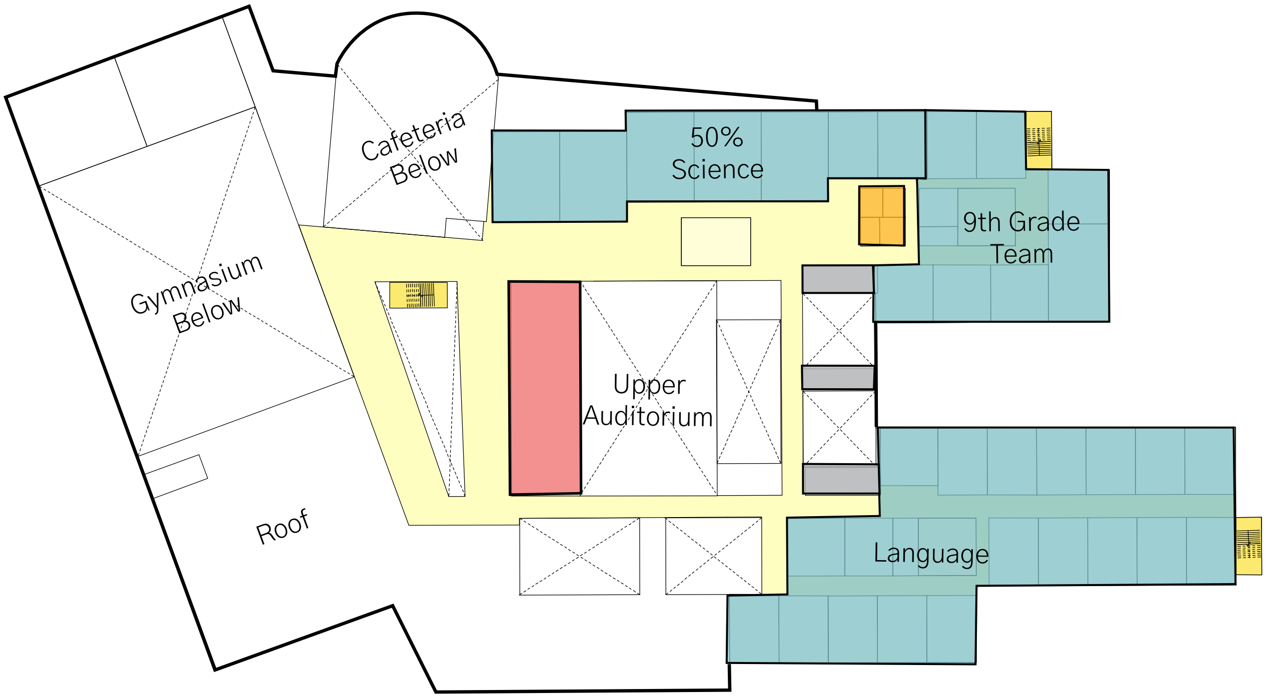
⬜ CIRCULATION

N

Doherty Memorial High School

299 Highland Street, Worcester MA

LPA|A



THIRD FLOOR

1”=100’

LEGEND

N

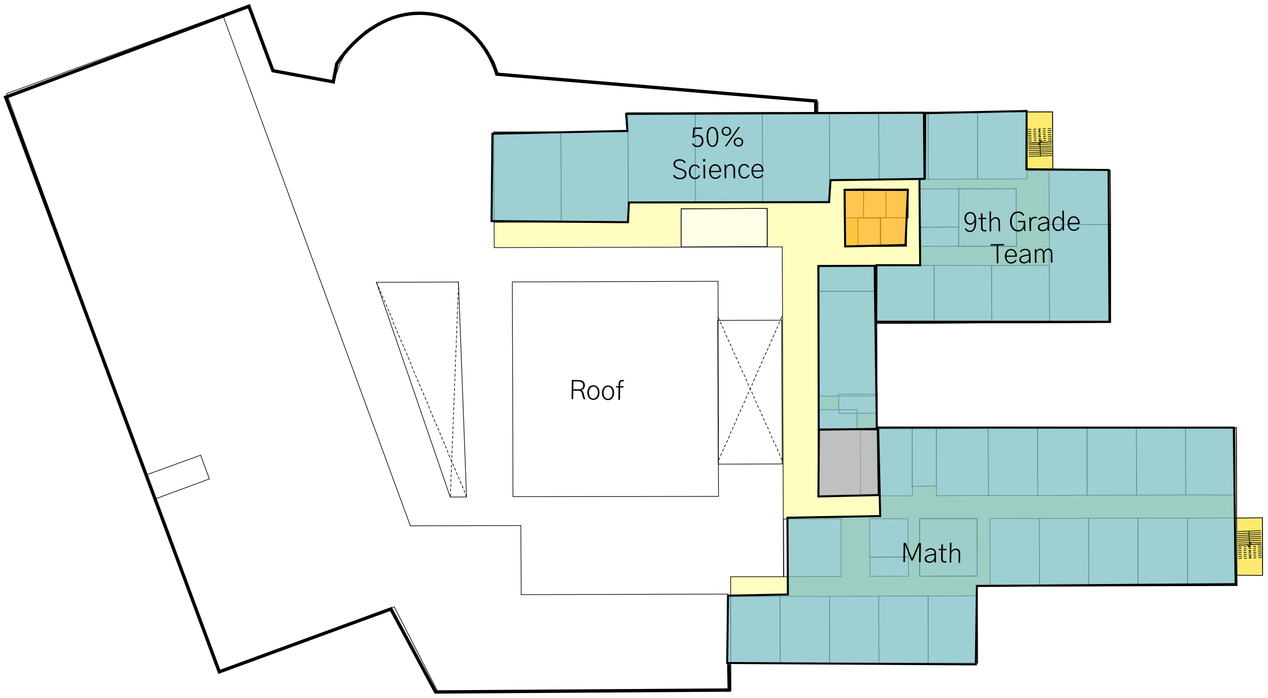
🟥 CORE FACILITY

🟦 ACADEMIC

🟨 ADMINISTRATION

⬜ BUILDING SERVICE

⬜ CIRCULATION



FOURTH FLOOR

1”=100’

LEGEND

N

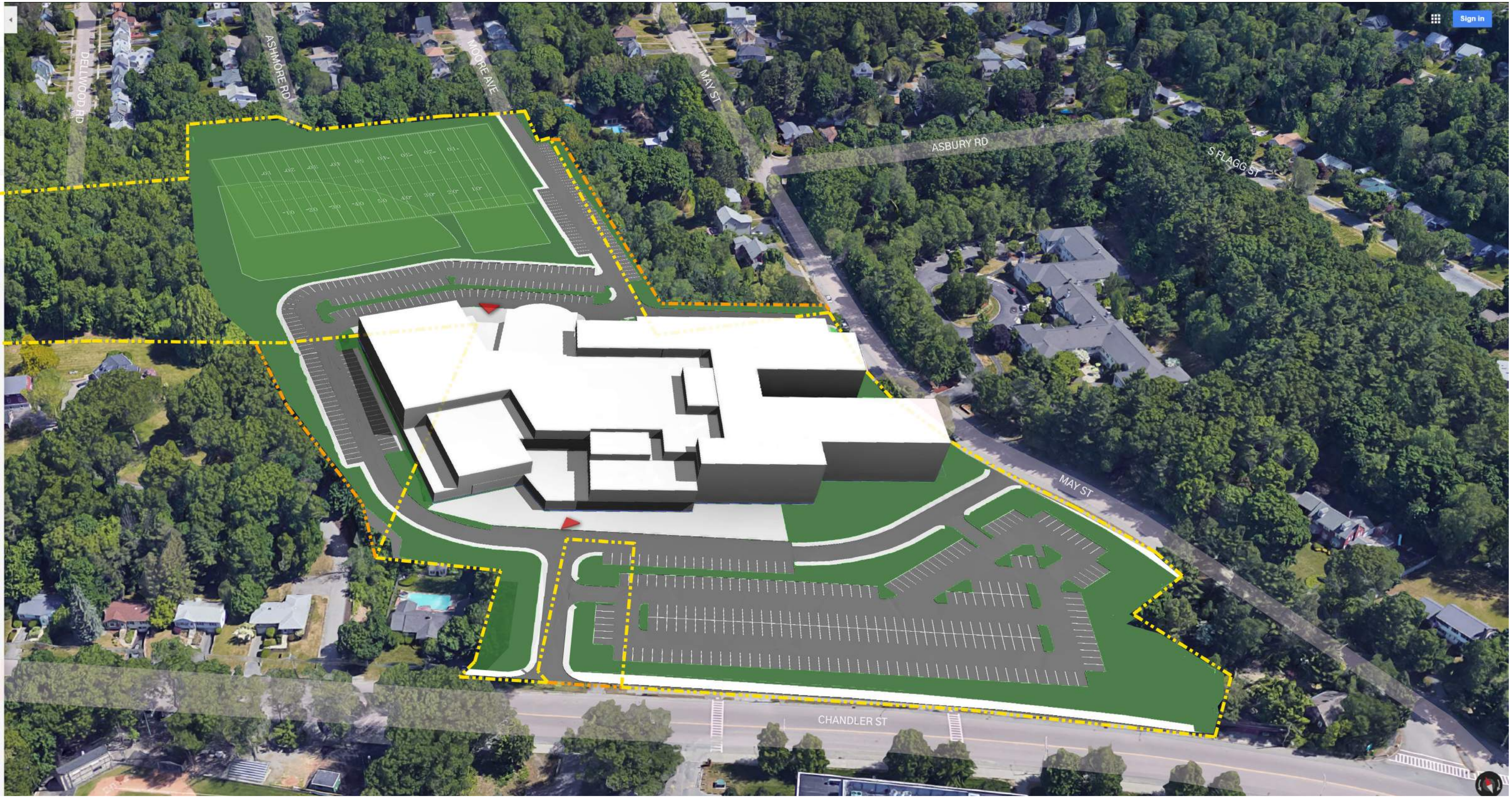
🟥 CORE FACILITY

🟦 ACADEMIC

🟨 ADMINISTRATION

▨ BUILDING SERVICE

□ CIRCULATION


DELLWOOD RD
ASHMORE RD
MOORE AVE
MAY ST
ASBURY RD
S FLAGG ST
MAY ST
CHANDLER ST
Sign in

3.3.3 FINAL EVALUATION OF ALTERNATIVES

D. Supporting Documents

1. Updated Basis of Design Narratives
    a. Architectural
    b. Site – Civil & Traffic
    c. Structural
    d. Fire Protection
    e. HVAC/Plumbing
    f. Electrical/Data/Security/Telephone/PA
    g. Food Services

GENERAL

The updated basis of design narrative incorporates, at the forefront, a summary of the Community Goals established during the Visioning Sessions prior to describing the technical aspects related to each option under further evaluation during the PSR. The design intent and approach to each preliminary design option precedes this section, reference sections 3.3.3.C.1-7, respectively.

COMMUNITY GOALS

The Doherty Memorial High School Visioning Sessions culminated in the definition of project goals and priorities for the re-imagined High School. Some of these goals and priorities have direct architectural implications that will help to establish the architectural basis of design. The following items are a summary of organizational or aesthetic architectural features which are desired in the new Doherty High School:

- An entry sequence which is welcoming yet secure, with an interactive dedication feature.
- A prominent lobby space that enhances and encourages community use after school hours.
- Building organization that ensures the educational program is equally accessible to all
- Building features displaying student work, to encourage a sense of "Doherty Pride"
- Integration of special education spaces so as to increase inclusion and reduce stigma.
- Organization of classrooms to create 9th grade "communities" to assist the challenging transition into high school.
- Introduce and feature STEM spaces that the existing Doherty High School could not spatially support, such as Maker Spaces, Computer Science Classrooms, Science Labs and Chapter 74 Spaces.
- Careful consideration of massing and daylighting of interior spaces.
- Featured spaces that will be used for collaboration.
- Durable and low maintenance interior finishes, with a "timeless" color palette
- Integration of the history of Doherty Memorial High School, featuring its role in the City of Worcester
- Building massing and façade design that is sensitive to the surrounding neighborhood scale and park land
- Durable and low- maintenance exterior materials
- Landscaping and site features compatible with the adjacent park and residential street scape

CODE UPGRADES

For purposes of this Feasibility Study, the Code Upgrade Option is defined as a "No-Build" solution that will maintain the status quo. It will not provide any additional square footage or address programmatic improvements to the existing School. The Code Upgrade Option addresses pre-existing code violations, removal of hazardous materials, improvements required due to scope-of-work code thresholds, and the repair/replacement of existing building systems that have either exceeded their life expectancy or have already failed. It also addresses items that should be replaced as the result of related work being performed in close proximity (for instance the replacement of existing ACT, lighting, data/communication, life safety and other in/above-ceiling systems that must first be removed to install a new fire suppression system). The following Code Upgrade scope of work is based on a thorough assessment of existing building systems by the Design Team. Proposed SF areas for this option are approximately as follows:

- **Renovation (existing building) = 167,000 GSF**

Code Upgrades Scope of Work:

- The work will be performed in multiple phases while the building is occupied, and that temporary "swing space" (i.e. modular Classrooms located the west end near the cafeteria loading dock) will be required to draw down the student population in the existing building. Temporary enclosures/partitions will be required to isolate work areas from occupied academic areas, and safe means of egress must be maintained at all times. Phasing will be scheduled to maximize productivity during summer vacations when the majority of common-space work (at Corridors, Stairs, Gym/Locker Rooms, Cafeteria/Kitchen, Administration, Media Center, etc.), will be accomplished; it is assumed that a second shift will be utilized during some or all of those times.

Site:

- Refer to NE Basis of Design narrative section 3.3.3.D.1.b.1

Building Exterior:

- Provide an accessible route from Highland Street to the Main Entrance and from the Main Entrance up along the easterly façade to the rear gym entry
- Replace missing sheet metal and roof drain strainers
- Sawcut new masonry control joints; provide new backer rod and joint sealant
- Repair roof leaks at rooftop HVAC equipment and other locations as required; existing EPDM roofing system to remain
- Replace broken glass
- Remove and replace all perimeter joint sealants at exterior penetrations and control joints
- Replace all exterior doors with new aluminum or steel doors

- Replace existing non-functional overhead doors
- Replace exterior door hardware
- Prepare and repaint steel lintels, plates and other exterior metal items

Building Interior:

- Provide full accessibility to comply with 521 CMR including but not limited to:
    - Provide an accessible route, including maneuvering clearances at doorways, to all interior spaces throughout
    - Provide new accessible hardware throughout
    - Provide accessible Toilet Room fixtures, partitions and accessories throughout
    - Provide accessible water fountains throughout
    - Provide new accessible signage throughout
    - Modify existing millwork (transaction areas, serving lines, reception desks, etc.) as required
    - Provide an elevator in each building with new controls, call stations, signals, 2-way emergency communications and other scope items as required
    - Modify all stair/ramp guardrails and handrails as required
    - Provide an accessible route, via a new platform lift, from the Auditorium to the Stage level
    - Provide accessible seating locations at Auditorium
    - Provide assistive listening systems at Auditorium, Cafeteria, Media Center, and Gymnasium
- Replace end of life or hazardous material embedded VCT flooring throughout with new resilient flooring and base
- Replace end of life carpet flooring with new vinyl-backed carpeting
- Repaint all interior walls and finishes
- Replace non-functional telescopic bleachers at Gymnasium
- Repair/replace non-functional Gymnasium equipment (basketball backstops, divider curtain, batting cage, etc.)
- Replace non-functioning Locker Room lockers
- Provide new ACT ceilings throughout
- Provide new window treatments throughout
- Replace non-functional Food Service equipment **(refer to Food Services Basis of Design narrative)**
- Provide new hand wash sinks at Kitchen **(refer to Food Services of Design narrative)**
- Replace wire glass with tempered or laminated safety glass at doors, frames and borrowed lites
- Provide new markerboards and tackboards at Classrooms throughout

Fixtures, Furnishings & Equipment (FF&E)/Technology:

- Remove all wall mounted televisions and provide new interactive projectors; typical at Classrooms and other learning spaces throughout
- Provide new furnishings where broken or exceeded lifespan

Hazardous Materials:

- Abate entire existing building
- Provide radon mitigation system at Lower Level slab-on-grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:

- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

Food Services:

- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.

RENOVATION / ADDITION

The Renovation/Addition Option scope of work includes renovation and partial demolition of the existing School, along with construction of multiple additions, to provide a solution that meets the Educational Program requirements to the maximum extent possible. This option accounts for the existing School remaining occupied during construction, the absence on or offsite swing space, and limited site areas for modular classrooms. The work will need to be done in multiple phases, including building additions, and phased renovation and reconstruction of all the existing spaces. This would include complete replacement of all systems, while maintaining the existing systems or providing temporary ones at select areas until renovated where possible. The following Renovation/Addition scope of work is based on a thorough assessment of existing building systems by the Design Team. Proposed SF areas for this option are approximately as follows:

Renovation (existing building)	**= 101,000 GSF**
Demolition (existing building)	**= 66,000 GSF**
Addition	**= 319,000 GSF**
Total	**= 420,000 GSF**

RENOVATION/ADDITION SCOPE OF WORK:

General:

- It is assumed that the work will be performed in multiple phases while the building is occupied, beginning with construction of a primary 3 to 4-story Addition at the east end of the existing building. The primary Addition will include new mechanical/electrical rooms and services sized to support not only the addition, but the entire project. In broad terms, the educational program will include the Engineering Technology Academy, 9th Grade Teams and Science department rooms. Upon completion of the primary Addition, it will be occupied by students and staff/faculty, and phased demolition/addition/renovation work will commence for the balance of the project. It is assumed that the primary Addition will provide enough space so that other "swing space" (i.e. temporary modular Classrooms) is not required. Temporary enclosures/partitions will be required to isolate work areas from occupied academic areas, and safe means of egress must be maintained at all times. Phasing will be scheduled to maximize productivity during summer vacations when the majority of common-space work (at Corridors, Stairs, etc) will be accomplished; it is assumed that a second shift will be utilized during some or all of those times.

Site:

- Refer to NE Basis of Design narrative section 3.3.3.D.1

Building Exterior:

- Provide new exterior wall construction (at Additions): Rainscreen system including metal stud back-up walls, glass fiber reinforced gypsum board, self-adhered air/vapor barrier (AVB), AVB transitions to window/door openings and roof systems, rigid insulation, thermally broken standoff clips, metal furring, joint sealants and masonry or metal wall panel system
- Provide new adhered PVC roofing system throughout, including all membrane/flashing, roof edging, sheet metal work, insulation, roof vapor barrier, wood blocking and other roof accessories (ladders, hatches, etc.) as required
- Replace all existing windows, storefront and curtainwall with new thermally broken aluminum systems, including 1" (min.) high performance insulating glass, perimeter joint sealants, insulated panels, screens, operable hardware, sheet metal work, air/vapor barrier (AVB) transitions and other accessories as required.
- Sawcut new masonry control joints; provide new backer rod and joint sealant
- Remove and replace all perimeter joint sealants at exterior penetrations and control joints
- Replace all exterior doors with new aluminum or steel doors
- Replace all hollow metal frames
- Replace existing overhead doors
- Replace exterior door hardware
- Prepare and repaint steel lintels, plates and other exterior metal items
- Provide new exterior wall cladding system at existing brick masonry throughout, including fluid-applied AVB, AVB transitions to window/door openings and roof systems, rigid insulation, thermally broken standoff clips, metal furring, joint sealants and exterior metal wall panel system

Building Interior:

- Provide Base Repair Option scope of work and the following:
- Provide new window treatments throughout
- Provide new millwork/casework throughout
- Provide new stair systems throughout, including at least one extending to the highest roof level
- Provide new Auditorium fixed seating
- Provide new interior partitions, doors, hardware, marker/tack boards and related items as needed to separate open learning space into individual Classrooms
- Provide new Food Service equipment at Kitchen (**refer to Food Services Basis of Design narrative**)
- Demolish portions of existing building as indicated; refer to floor plans

- Provide new ACT ceilings throughout

Fixtures, Furnishings & Equipment (FF&E)/Technology:

- Provide new FF&E throughout including furnishings, equipment, maintenance items, etc.
- Provide new Technology throughout including student/teacher computers, laptop carts, interactive projectors, servers, etc.

Hazardous Materials:

- Abate entire existing building prior to demolition scope of work
- Provide radon mitigation system at Lower Level slab-on-grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:

- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

Food Services:

- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.

NEW CONSTRUCTION

The New Construction Option on the existing site is based on a new building located on the practice field area east of the existing building, and assumes that the new building will be constructed while the existing building remains fully occupied. For the New Construction on alternate site options, a new building located over the stadium, football game field and track at the Foley Stadium Site and over the elementary school at the Chandler Magnet School site. In both options, the existing Doherty High

School will remain fully occupied with the further benefit of eliminating disruption to the site and its features (parking and practice field use). The difference, however, is the new High School placement directly displaces all of the Foley Stadium amenities or Chandler Magnet Elementary School use, in their entirety, if one of those sites were to be selected. The implication for either alternate sites is substantial and require additional planning, coordination and action by the district, if selected.

For New Construction on the existing site, once the new building is complete, the existing building would be demolished, albeit in phases, but ultimately in its entirety. Any remaining site features (parking, driveways, athletic fields, etc.) would then be completed. The phasing intent would be three-fold. Complete the school and immediate driveways essential for daily use. Then complete permanent parking layout and balance of driveways. Lastly, complete the fields and final landscaping. While there will be **temporary** construction impacts with this option, most notably the loss of nearly all existing outdoor areas, they are primarily site-related and the end result is a solution that meets the Educational Program requirements. Neither the existing site or alternate sites have the capacity to fully meet the site program. Therefore, the site program has been prioritized and incorporated respectively to each site and its capacity to meet the site program needs with several off-site improvement options to augment on site shortcomings. The alternate sites would share the final site phasing strategy and intent as mentioned for new construction on the existing site.

Proposed SF areas for this option are approximately as follows:

- **New Construction = 420,000 GSF**
- **Demolition (existing building) = 167,000 GSF**

NEW CONSTRUCTION SCOPE OF WORK:

General:

- It is assumed that the work will begin with construction of a new building, including associated sitework infrastructure. The existing site has the most on-site constraints, if selected. The alternate sites, not addressing the existing use displacement, the on-site constraints would be less as those parcels would become un-occupied removing constraints related to occupied site construction. The contractor would have then entire site to be utilized by the Contractor for material laydown/storage, worker/equipment parking areas and temporary office trailers. However, at the existing site, the available space is the opposite condition with limited area for any of the previously mentioned for the contractor. It is anticipated that only temporary office trailers with limited parking and material laydown/storage be available on-site. During this time the existing building would remain fully occupied and function, internally, much like it does presently. Externally, construction access would impact vehicular traffic to the rear of the existing building and the PE/Athletic fields would be unavailable. We expect that the Contractor will access the site via a separate driveway on the east side of the site. Similar to the Base Repair and Renovation/Addition Options, summer vacation months will be leveraged to maximize productivity for work (i.e. sitework such as repaving, new site utilities, drainage infrastructure, etc.) that would normally disturb school vehicular/pedestrian traffic and learning environment.

Site:

- Refer to NE Basis of Design narrative section 3.3.3.D.1

Building Exterior/Interior:

- Provide new construction as follows:
  - Exterior walls: Rainscreen system including metal stud back-up walls, glass fiber reinforced gypsum board, self-adhered air/vapor barrier (AVB), AVB transitions to window/door openings and roof systems, rigid insulation, thermally broken standoff clips, metal furring, joint sealants and masonry or metal wall panel system
  - Roofing: Adhered PVC roofing system throughout, including all membrane/flashing, roof edging, sheet metal work, insulation, roof vapor barrier, wood blocking and other roof accessories (ladders, hatches, etc.) as required
  - Windows and Curtainwall: Thermally broken aluminum systems, including 1" (min.) high performance insulating glass, perimeter joint sealants, insulated panels, screens, operable hardware, sheet metal work, air/vapor barrier (AVB) transitions, solar shading devices, window treatments and other accessories as required
  - Interior partitions: Metal stud and Gypsum Wall Board (GWB) assemblies as required for structural and acoustical requirements; Concrete Masonry Units CMU at Gymnasium, Locker Rooms, and other high-abuse areas
  - Doors, Frames and Hardware: Hollow metal and solid-core wood veneer doors; custom welded steel frames and borrowed lites; and lever type mortise hardware, electrified at exterior entries
  - Millwork/Casework:
    - Classroom units with storage shelving, tall wardrobe and material storage units, and lockable low storage cabinets
    - Wall paneling system at Auditorium and Lobby
    - Custom cabinetry at main Administrative offices, Media Center, Auditorium/Stage, Cafeteria and other locations as required

- Finishes:
  - Corridors, Stairs and Cafeteria: Linoleum flooring and resilient base, resilient stair treads, ceramic wall tile to 7' with painted GWB above, ACT
  - Classrooms: Linoleum flooring, resilient base, painted GWB, ACT
  - Kitchen: Seamless epoxy flooring/base, FRP wall paneling, washable ceiling tile system
  - Administrative Offices, Media Center and Computer Labs: Carpet flooring, resilient base, painted GWB, ACT
  - Auditorium and Stage: Carpet (Auditorium aisles) and wood (Stage) flooring, wood and acoustic wall paneling, acoustic ceiling panels and exposed painted structure above
  - Gymnasium: Resilient tongue and groove maple flooring system (competition court area), synthetic resilient composite athletic flooring system (remaining gym floor areas), resilient base, painted CMU to 12' with abuse-resistant GWB above, wall padding, acoustical wall panels, painted acoustical cellular roof deck
  - Locker Rooms: Seamless epoxy flooring/base, painted CMU walls, wood fiber tile ceilings
  - Shops: Sealed concrete floors, resilient base, Painted CMU walls, exposed painted structure above
- Provide new Food Service equipment at Kitchen and Culinary Arts **(refer to Food Services Basis of Design narrative)**
- Demolish existing building in its entirety after new construction is complete and ready for occupancy

Fixtures, Furnishings & Equipment (FF&E)/Technology:

- Provide new FF&E throughout including furnishings, equipment, maintenance items, etc.
- Provide new Technology throughout including student/teacher computers, laptop carts, interactive projectors, servers, etc.

Hazardous Materials:

- Abate entire existing building prior to demolition
- Provide radon mitigation system at Lower Level slab-on-grade areas

Structural:

- Refer to the Structural Basis of Design narrative in Section 3.3.3.D.1.

Fire Protection:

- Refer to the Fire Protection Basis of Design narrative in Section 3.3.3.D.1.

Plumbing:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

HVAC:

- Refer to the HVAC/Plumbing Basis of Design narrative in Section 3.3.3.D.1.

Electrical:

- Refer to the Electrical Basis of Design narrative in Section 3.3.3.D.1.

Food Services:

- Refer to the Food Service Basis of Design narrative in Section 3.3.3.D.1.

Sullivan Code Group
R.W. Sullivan Engineering
Code Consulting . HVAC . Electrical . Plumbing . Fire Protection

MEMORANDUM

TO: Rob Para – LPA

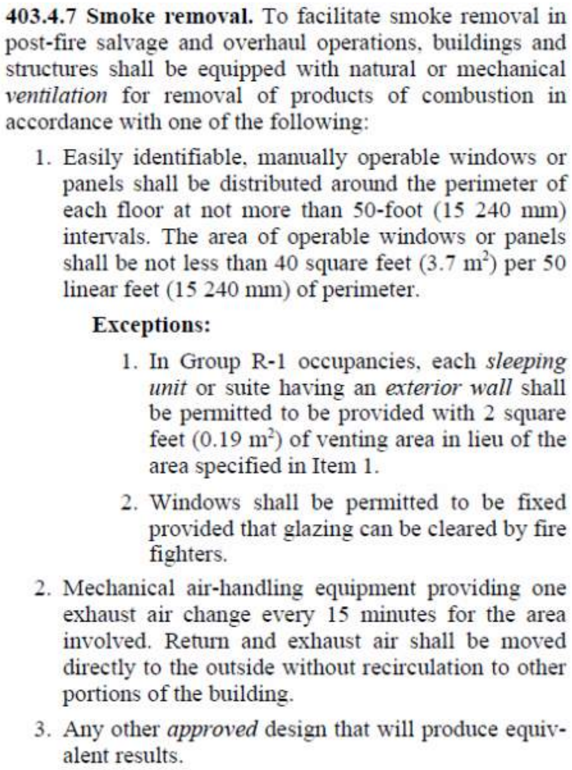
FROM: Don E. Contois, P.E.

DATE: November 13, 2019

SUBJECT: Doherty High School – High Rise Implications

This memo summarizes the requirements applicable if the proposed Doherty High School is classified as a high rise building based on the requirements contained in the Massachusetts State Building Code (780 CMR). The building would be classified as a high rise building if the highest roof is more than 70 feet above grade plane (780 CMR 202). The items in bold are the additional building elements that would be required if the building is constructed as a high rise structure (does not include structural implications, if any):

- **Type IIA Construction (modified from Type IB)** rather than Type IB construction (403.2.1.1)
- **Minimum bond strength of sprayed fire resistance materials must be 430 psf.**
- Automatic sprinkler system (403.3)
- **Secondary on-site water supply if the building is Seismic Design Category C, D, E, or F (403.3.3)**
- Fire pump room with a **2 hour fire resistance rating** rather than a 1 hour rating (403.3.4 & 913.2.1)
- **Smoke detection in select spaces (403.4.1)**
- Fire alarm system (403.4.2)
- **Automatic** standpipe system (403.4.3)
- Emergency voice/alarm communicating system (403.4.4)
- Emergency responder radio coverage or wired fire department communication system (403.4.5, 907.2.13, & 916.2)
- **Fire command center must be a minimum of 200 sqft with a minimum dimension of 10 ft (403.4.6 & 911.1.3)**
- **Manual or automatic smoke removal system for fire department operations in accordance with the options listed (403.4.7):**



403.4.7 Smoke removal. To facilitate smoke removal in post-fire salvage and overhaul operations, buildings and structures shall be equipped with natural or mechanical *ventilation* for removal of products of combustion in accordance with one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50-foot (15 240 mm) intervals. The area of operable windows or panels shall be not less than 40 square feet (3.7 m^2) per 50 linear feet (15 240 mm) of perimeter.

   Exceptions:

   1. In Group R-1 occupancies, each *sleeping unit* or suite having an *exterior wall* shall be permitted to be provided with 2 square feet (0.19 m^2) of venting area in lieu of the area specified in Item 1.
   2. Windows shall be permitted to be fixed provided that glazing can be cleared by fire fighters.

2. Mechanical air-handling equipment providing one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
3. Any other *approved* design that will produce equivalent results.

- Standby power and emergency power systems for electric fire pumps, elevators, **fire command center, and shaft pressurizing equipment (403.4.8)**
  - **Fuel line supplying the generator must be separated from the remainder of the building by 2 hour fire resistance rated construction (403.4.8.2).**
- **All exit stairs greater than 75 ft. in height above the lowest level of fire department access must be pressurized (403.5.4, 909.20.5, and 1023.11.1)**
- **Luminous egress path markings (403.5.5)**
- **Elevator hoistway opening protection by one of the following methods (IBC 3006.3):**

  - **Elevator lobbies separated by smoke partitions.**
  - **Additional doors or curtains that resist the passage of smoke in accordance with UL 1784.**
  - **Elevator hoistway pressurization.**

Furthermore, because the building is Risk Category III (Group E with more than 250 occupants) per IBC Table 1604.5, these additional items are required:

- **Wall assemblies making up exit enclosures and elevator hoistways must meet or exceed Soft Body Impact Classification Level 2 as**

described in test method ASTM C 1629/C 1629M, which can be met by construction with concrete/masonry walls (403.2.3.1 & 403.2.3.3)

- **Face of wall assemblies, that are not exposed to the interior of the hoistway or exit enclosure, must be constructed according to one of these three methods, which can be met by construction with concrete/masonry walls (403.2.3.2 & 403.2.3.3)**

  1. **Wall assembly incorporates at least two layers of impact resistant construction board that meets or exceeds Hard Body Impact Classification Level 2 measured by ASTM C1629/C1629 M**

  2. **Wall assembly incorporates at least one layer of impact resistant construction board that meets or exceeds Hard Body Impact Classification Level 3 measured by ASTM C1629/C1629 M**

  3. **Wall assembly incorporates multiple layers of any material tested in tandem that meet or exceed Hard Body Impact Classification Level 3 measured by ASTM C1629/C1629 M**

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3.3.3 Final Evaluation of Alternatives

D.1.b.1 Existing Site Options

1.0 INTRODUCTION

Nitsch Engineering has prepared this Final Evaluation of Alternatives narrative as part of a Massachusetts School Building Authority (MSBA) Module 3 - Feasibility Study for the redevelopment of Doherty Memorial High School in Worcester, MA. This report corresponds to the MSBA Module 3 Preferred Schematic Report (PSR) and focuses specifically on the site development aspects of redevelopment options on the existing Doherty High School site (see Report Section 3.3.3 D.1.b.2 for evaluation of development options on two alternative sites). The options studied for the existing Doherty High School site include:

- Code Upgrade
- Addition Renovation
- A.1 New Construction on Existing Site – Pods on Park
- A.2 New Construction on Existing Site – Olmsted Homage
- A.3 New Construction on Existing Site – Highland Proud

2.0 MODULE 3.3.3, A.: FINAL EVALUATION OF ALTERNATIVES – EXISTING SITE

2.1 Code Upgrade Option

The Code Upgrade Option represents the improvements required to align the existing school facility with current codes and standards, and to repair or replace aspects of the facility that have exceeded their useful life or have already failed. The improvement items referenced in this section and those listed under all other development alternatives are related to site construction only. Refer to the architectural narrative by LPAA for development items related to the actual school building. The Code Upgrade Option for the Doherty Memorial High School project include renovation of the existing 167,000sf building, and the addition of 30,000sf of modular classroom units. See Figure: “Code Upgrade”.

Certain aspects of the building renovation effort will result in disruption of the site, including installation of temporary modular classrooms during the construction phase to facilitate swing space, and related or unrelated building service utility construction for example. Regardless of the site disruption related to the building renovation, the deteriorated condition of most of the site pavements, lack of accessible routes, and other aspects of the Site that are in disrepair or do not comply with current codes and standards will require significant site construction under any redevelopment scenario.

Access Improvements

Currently, the Site lacks accessible route connections from Highland Street to the building entrances and between various points internal to the Site. Necessary access improvements, which may require ramp construction where an accessible route is indicated, include:

- An accessible route, via new sidewalks and curb cuts, from Highland Street to the main entry of the school;
- Accessible parking and an accessible route from the bus loop to the main entry of the school;

- Accessible parking and an accessible route from the parking area on the east side of the school building to all adjacent school entrances;
- Accessible parking and an accessible route from the upper parking area to the athletic fields;
- An accessible route from the school building to the athletic fields; and
- Repair or replacement of all levels and locations of the exterior stairs that connect Highland Street to the school building.

Pavement and Service Improvements

Except for the bus loop, all site paving elements including access drives, sidewalks, and curb cuts require replacement.

- Reclaim, repave, and restripe all parking and access drives and service areas,
- Remove and reset (or replace where needed) all existing granite curbs,
- Reconstruct existing curb cuts to comply with current standards,
- Provide improved exterior wayfinding and directional signage, and
- Upgrade the receiving area and provide enclosure for the kitchen waste compacter.

The portion of the existing southeastern parking lot (adjacent to the existing athletic fields) that encroaches onto the remaining land of Elm Park (Newton Hill) and which provides shared parking for the school and for the Newton Hill trails will remain under this development option, with certain improvements to be negotiated with the park users.

Site Utilities

Some aspects of the site and building renovation work will require associated site utility improvements. The most significant site utility improvements will result from the reconstruction of site pavements. In accordance with the City of Worcester Wetland Protection Bylaw, the repaving operation will trigger the need for compliance with the Massachusetts Department of Environmental Protection Stormwater Standards (DEP Standards). Compliance with the DEP Standards will require provision of Best Management Practices (BMPs) for water quality treatment (likely structural due to spatial constraints). Assuming that under the No Build option, site paving would be replaced, and not significantly expanded, peak flow controls and groundwater recharge under the DEP Standards are not likely to be significant. Storm drainage improvements could include:

- Retrofit or replace existing stormwater collection structures (catch basins) to comply with current standards for deep sumps and hoods, and
- Install structured water quality treatment BMPs upstream from existing stormwater system connection points at Highland Street.

Other site utility improvements are related to building-specific improvements including:

- A below-grade exterior grease trap and associated piping (this will likely correspond to interior plumbing reconstruction to separate kitchen discharge piping from the ordinary sanitary waste piping);
- An exterior acid waste neutralization tank (assuming laboratory use is continued or initiated);
- Temporary utility services to support modular classroom structures (domestic water and fire protection, sanitary sewer, electric/tel-comm.); and
- Possible upgrades as required to support renovated building systems (see narratives by other engineering consultants).

2.2 Addition and Renovation Option

The Addition and Renovation option includes demolition of the existing school gymnasium, renovation to the remainder of the building, construction of several new building additions, and construction of a new athletic field (football) as described in the architectural narrative by LPAA. The site improvements that are associated with this option are similar to those required for the No Build option in terms of overall scale, but with an added earth moving component that will be necessary to construct the building additions, relocate/reconfigure parking and access facilities, to improve/expand site access on the south (upper) side of the building development area, and to construct the new athletic field. See Figure: “Addition Renovation”.

Access Improvements

Like the Code Upgrade option, improvements to site access and accessibility will be required including provision for:

- An accessible route, via new sidewalks and improvements to existing and construction of new curb cuts from Highland Street to the main entry of the school (may require ramps);
- Accessible parking and an accessible route from the bus loop to the main entry of the school (may require ramps);
- Accessible parking and an accessible route from two new parking areas on the east and west sides of the school building to all adjacent school entrances;
- Accessible parking and an accessible route from the upper parking area to the athletic fields;
- An accessible route from the school building to the athletic fields; and
- Repair or replacement of all levels and locations of the exterior stairs that connect Highland Street to the school building.

Pavements and Parking

Except for the bus loop, all site paving elements including access drives, sidewalks, curb cuts require replacement. Existing access and parking facilities will be reconfigured:

- Construct new curb cuts on Highland Street for relocated access drives;
- Construct 2 new access drives and parking lots (with reclaimed granite curbs) totaling approximately 2 acres to accommodate roughly 375-400 parking spaces;
- Provide new exterior lighting, wayfinding, and directional signage; and
- Reconstruct a new receiving loading in accordance with the stated site development requirements.

The portion of the existing southeastern parking lot (adjacent to the existing athletic fields) that encroaches onto the remaining land of Elm Park (Newton Hill) and which provides shared parking for the school and for the Newton Hill trails will be replaced and reconfigured under this redevelopment option. The new parking would be separated from the main parking areas for school use and would be configured to more closely complement parking and access for the Newton Hill trail system.

Earth Moving

Phased construction could result in separated cut and fill operations to facilitate construction of various aspects of the development as long-term soil stockpiling at the Site is not likely to be feasible. In addition to general excavation and fill operations needed for parking lot and building addition construction, improved access around the new and existing school building complex will require excavation into the existing hillside on the south side of the developed portion of the parcel. For planning purposes, it is reasonable to assume that approximately 900 linear feet of retaining walls with low to moderate height would be required to facilitate access. It is anticipated that retaining wall types that are tiered, vegetated, or are otherwise designed to blend with the existing landscape would be considered during the design process for the project.

Site Utilities

Site utility improvements for the Addition and Renovation option will be more extensive than those required for the No Build option. The reconfiguration of the existing parking and access areas and the construction of building additions is likely to result in an increase in the total impervious coverage of the Site, triggering requirements for compliance with aspects of DEP Standards for peak flow controls and groundwater recharge in addition to the water quality mitigation required under the No Build option. Also, substantial reconfiguration of parking and access areas will likely require replacement of most of the existing stormwater pipe and structure network. Storm drainage improvements are likely to include:

- Installation of a new closed-pipe stormwater collection and conveyance system including deep-sump hooded catch basins,
- Construction of structured subsurface groundwater recharge system(s),
- Construction of structured subsurface stormwater detention system(s) (could be coincident with groundwater recharge), and
- Install structured water quality treatment BMPs for water quality treatment.

Other site utility improvements are related to building-specific improvements including:

- A below-grade exterior grease trap and associated piping (this will likely correspond to interior plumbing reconstruction to separate kitchen discharge piping from the ordinary sanitary waste piping);
- An exterior acid waste neutralization tank (if laboratory use is continued or initiated);
- Temporary utility services (domestic water and fire protection, sanitary sewer, electric/tel-comm.);
- Additional sanitary sewer services for building additions; and
- Possible upgrades as required to support renovated building systems (see narratives by other engineering consultants).

2.3 Option A.1 New Construction on Existing Site – Pods on Park

General

All New Construction options on the existing Doherty site includes complete demolition of the exiting school, construction of a new school building, new access drives and parking facilities, and new athletic field(s).

Access and Parking

The Site would be accessed by three new curb cuts on Highland Street. The western-most curb cut would provide direct access to the new athletic field and would also connect to the central area of the site. The middle curb cut to the east would provide access to the dual loops for bus circulation and parent drop-off. The eastern-most curb cut would be the primary access to the building service and loading areas. It would also serve as a site access loop around the rear of the building, would provide access to the southern/upper building entrance area, and would also connect to a small parking area that would provide parking for and access to the Newton Hill trail system.

Approximately 300+/- parking spaces would be provided on surface parking lots situated on the interior of the parent drop-off and bus loops and along the site frontage. Additional parking would be provided in a parking garage located within the proposed building footprint. The surface parking areas and access drives will require a total of approximately 4.0 acres of full-depth asphalt paving.

ADA-compliant pedestrian access will be provided at the two westerly curb cuts for day-to-day use. Pedestrian access will be available at the eastern service drive but will not be emphasized for common use. A central pedestrian corridor will extend between the bus and parent drop-off loops and will connect the main entrance of school building with the parking garage. A separate pedestrian route from the school building to athletic field will be provided on the south side of the site.

Earth Moving

Like the Add/Reno option, phased construction could result in separated cut and fill operations to facilitate construction of various aspects of the development as long-term soil stockpiling at the Site is not likely to be feasible. The final build-out will require excavation into the existing hillside on the south side of the developed portion of the parcel. For planning purposes, it is reasonable to assume that approximately 1,200 linear feet of retaining walls of low to moderate height would be required to facilitate construction of the project. It is anticipated that retaining wall types that would be tiered, vegetated, or are otherwise designed to blend with the existing landscape would be considered during the design process for the project. The area immediately south of the new athletic fields would include spectator seating (bleachers) constructed into the existing slope, with flanking terraced walls to the east and west.

In order to accommodate construction of the new building and other site features while providing ADA-compliant and other practical access to the site, a relatively extensive soil export will be required, possibly in excess of 200,000CY of soil material.

Water Utilities

A new galvanized ductile iron water service main (2,200LF+) will be required to provide domestic water and fire protection services to the site. Four to six new fire hydrants are likely to be required.

Sanitary Sewerage

New sanitary sewer pipes and structures will be required including multiple building service connections, a dedicated kitchen service connection with an exterior grease trap vented to the building plumbing system, and dedicated drains for the covered parking area and any portion of the new building equipped to receive/store vehicles and/or gasoline-powered equipment. The latter dedicated service connections would also require gas/oil separators.

Storm Drainage

A new stormwater management system that complies with the requirements of the MA DEP Stormwater Standards will be required for the project. The system will include provisions for peak flow management, groundwater recharge, and water quality treatment. Although some opportunities for inclusion of low-impact development stormwater Best Management Practices (BMPs) might become available (bioretention areas, rain gardens, etc.), the compact nature of the site layout will likely restrict stormwater management BMPs to structured/subsurface systems. Due to the nature of the existing soil and because of the relatively extensive cut required to construct the project, positioning of some types of subsurface systems for groundwater recharge may be challenging.

Phasing

To address the lack of available swing space for the school population, the project would be constructed in four general phases.

Phase 1 would be an "Enabling Phase" and would include modifications to the existing school site to provide additional parking and access facilities to be used during construction. The design intent for major earthwork and wall construction during this phase would include anticipate that these elements would be permanent as part of the eventual site build-out. All existing building utility services would need to be maintained during the entire construction period until the point at which the new school building was ready for occupancy.

Phase 2 would follow completion of the Enabling Phase and would include construction of the new school building in the current location of the athletic fields and adjacent parking area. Temporary pavement surrounding the existing school building would be installed to accommodate parking needs for the school during this phase. Construction of a retaining wall of similar scale as required for the Add/Reno option would be needed to accommodate Phase 1 parking and access requirements and the eventual build-out of the Site.

Phase 3 would be undertaken following completion of the new building construction and would involve demolition of the existing school building and construction of new access drives, some surface parking, and bus and service access to the new building. During this phase student and overflow parking would be limited.

Phase 4 would include construction of the elevated athletic field(s) and parking garage.

2.4 Option A.2 New Construction on Existing Site – Olmsted Homage

General

As for the previous option, A.2 Olmsted Homage includes complete demolition of the exiting school, construction of a new school building, new access drives and parking facilities, and new athletic field(s). In order to accommodate the parking objectives for the project for this option, some of the parking needs would be accommodated by garaged parking within the northern end of the new school building. Unlike A.1, the athletic fields would be constructed at-grade. See Figure: "A.2 Olmsted Homage".

Access and Parking

The Site would be accessed by three new curb cuts on Highland Street. Buses and passenger vehicles would enter the site at the western-most curb cut which would be an "enter only" access point. This access road would extend to the south of the athletic fields, with adjacent parking for field and school use. This drive will split with the passenger vehicles accessing a centrally-located parking lot and drop off area, and the buses would continue slightly farther east and turn north to access the student drop-off at the main building entrance. Buses and passenger vehicles would continue north and exit the site at the center curb cut which would operate in an "exit only" condition. Beyond bus/drop-off split, the access road would extend to the rear of the school (with two-way traffic) with access to the southern/upper building entrance area, building service areas, and the Newton Hill trail access lot.

Approximately 200+/- parking spaces would be provided exterior to the building. These parking areas and the access drives will require a total of approximately 2.6 acres of full-depth asphalt paving.

ADA-compliant pedestrian access will be provided at the two westerly curb cuts for day-to-day use. Pedestrian access will be available at the eastern service drive but will not be emphasized for common use.

Earth Moving

Like previously described options, phased construction could result in separated cut and fill operations to facilitate construction of various aspects of the development as long-term soil stockpiling at the Site is not likely to be feasible. The final build-out will require excavation into the existing hillside on the south side of the developed portion of the parcel. For planning purposes, it is reasonable to assume that approximately 1,200 linear feet of retaining walls of low to moderate height would be required to facilitate construction of the access loop road and to generally accommodate the project. It is anticipated that retaining wall types that are tiered, vegetated, or are otherwise designed to blend with the existing landscape would be considered during the design process for the project.

In order to accommodate construction of the new building and other site features while providing ADA-compliant and other practical access to the site, a relatively extensive soil export will be required. The lack of the structured athletic field included in Option A.1 may offer more flexibility in site grading conditions and possibility to reduce the total site export, but a significant export (150,000CF+/-) will still be required,

Water Utilities

Water utility requirements for Option A.2 will be generally similar to those for Option A.1 with the exception that the site configuration may allow for a slightly shorter service main loop at roughly 1,700LF+/-.

Sanitary Sewerage

Sanitary sewerage requirements for Option A.2 will be similar to those for Option A.1.

Storm Drainage

Stormwater management requirements for Option A.2 will be similar to those for Option A.1 with the exception that the peak flow and groundwater mitigation requirements may be smaller in scale due to the lack of a structured field over parking condition.

Phasing

Phasing requirements for Option A.2 will be similar to those for Option A.1.

2.5 Option A.3 New Construction on Existing Site – Highland Proud

General

As with the previous options, A.3 Highland Proud includes complete demolition of the exiting school, construction of a new school building, new access drives and parking facilities, and new athletic field(s). In order to accommodate the parking objectives for the project for this option, some of the parking needs would be accommodated by a parking area with structured athletic field above, similar to Option A.1. See Figure: “A.3 Highland Proud”.

Access and Parking

The Site would be accessed by four new curb cuts on Highland Street. From west to east, the first curb cut would primarily provide passenger vehicles direct access to the open-air parking garage. The second curb cut would be an “entrance only” for passenger vehicles and buses. Passenger vehicles would drive south to access a series of central parking areas, and a student drop-off area via a looped drive. Buses would turn left to access a bus loop located on the north side of the building. Buses could loop around to the west and exit the site along with passenger vehicles at the third, and “exit-only”, curb cut. Buses could also exit the site directly from the bus loop at a “right turn only” exit at the fourth curb cut. This curb cut would also allow access to the site for service and emergency vehicles and would connect to a driveway that loops around the east side of the school, connecting to service areas, the southern/upper school entrance, and the Newton Hill trail parking area.

Approximately 390+/- parking spaces would be provided under this option. The parking areas and the access drives will require a total of approximately 6.0 acres of full-depth asphalt paving.

ADA-compliant pedestrian access will be provided at all of the new curb cuts for day-to-day use.

Earth Moving

Like previously described options, phased construction could result in separated cut and fill operations to facilitate construction of various aspects of the development as long-term soil stockpiling at the Site is not likely to be feasible. The final build-out will require excavation into the existing hillside on the south side of the developed portion of the parcel. For planning purposes, it is reasonable to assume that approximately 1,200 linear feet of retaining walls of low to moderate height would be required to facilitate construction of the access loop road and to generally accommodate the project. It is anticipated that retaining wall types that are tiered, vegetated, or are otherwise designed to blend with the existing landscape would be considered during the design process for the project.

In order to accommodate construction of the new building and other site features while providing ADA-compliant and other practical access to the site, a relatively extensive soil export will be required, possibly in excess of 200,000CY of soil material.

Water Utilities

Water utility requirements for Option A.3 will be similar to those for Option A.1.

Sanitary Sewerage

Sanitary sewerage requirements for Option A.2 will be similar to those for Option A.1.

Storm Drainage

Stormwater management requirements for Option A.2 will be similar to those for Option A.1.

Phasing

Phasing requirements for Option A.2 will be similar to those for Option A.1.

3.3.3 Final Evaluation of Alternatives

D.1.b.2. Alternative Sites

1.0 INTRODUCTION

Nitsch Engineering has prepared this Final Evaluation of Alternatives narrative as part of a Massachusetts School Building Authority (MSBA) Module 3 - Feasibility Study for the redevelopment of Doherty Memorial High School in Worcester, MA. This report corresponds to the MSBA Module 3 Preferred Schematic Report (PSR) and focuses specifically on the site development aspects of redevelopment options on two alternative development sites including:

- B.1 New Construction on Foley Stadium Site
- C.2 New Construction on Chandler Magnet School Site with Added Land

2.0 MODULE 3.3.3: FINAL EVAL. OF ALTERNATIVES - ALTERNATIVE SITES

2.1 Option B.1 New Construction on Foley Stadium Site

Nitsch Engineering conducted an existing site conditions and site development assessment of the Foley Stadium site to evaluate site features and characteristics that may affect new school construction on the site. The assessment was based on record information provided to us by the City of Worcester, presented in the City of Worcester's graphic information system (GIS) database, and presented in the Massachusetts Geographic Information System (GIS), and based on visual observations made during several site visits by Nitsch Engineering personnel.

2.1.1 Existing Site Conditions

Location and Configuration

The subject site (Site) is located at 50 Abbott Street in Worcester, MA. The associated parcel is listed as Worcester Assessor's Office Parcel Number 14-044-00001. The Worcester Assessor's database lists the parcel area at 12.22 acres. Measurement of record mapping of the parcel indicates that the total area may be approximately 14 acres. The parcel is owned by the City of Worcester School Department.

The Site is situated on the north side of Chandler Street, approximately 700 feet west of the intersection of Chandler Street (MA Route 122) and Park Avenue (MA Route 9/12). Beaver Brook Park is directly across Chandler Street from the Site.

The Site is trapezoidal in shape, with most of its frontage derived from Chandler Street at 900 feet (despite its Abbott Street address). The northerly end of the Site is approximately 400 feet wide and the average depth of the Site is roughly 900 feet. The Site is bounded on the west and north by single-family residential lots. Single-family lots also line the east side as well, except for the small section of the parcel that connects to Abbott Street.

Zoning, Easements, Restrictions

The Site is located within the RS-7 Residential zoning district; single & two-family residential dwelling district with 7,000sf minimum lot size. The existing school use is allowed by right in this district. No portion of the Site appears to be located within other zoning districts, historic districts, or other overlay districts.

There do not appear to be any easements, rights of way, historic registrations, or other encumbrances related to use on the Site, based on City of Worcester Assessor's data. However, the deed that is related to conveyance of the parcel to the City of Worcester School Department (WCRD Book 2294, Page 37) states that the use of the parcel "*shall forever be used for athletic, playground park, and other public use by the City of Worcester*". The City of Worcester will review and advise if this constitutes a restriction to development of the parcel with a new school building.

Existing Development

Nearly the entire Site is developed with a stadium building, accessory building, parking area, football field / track facility, other athletic fields, and tennis courts. The Site is accessed by a single curb cut on Chandler Street.

Physical Characteristics

The Site is relatively flat, with slopes in most areas at 2-3%+/-.

Except for the small portion of the Site immediately adjacent to Abbott Street and several isolated trees on the Chandler Street frontage, the Site is nearly free from tree cover. The rest of the Site is covered by athletic field surfaces and ordinary lawn

National Resources Conservation Service (NRCS) data lists the soil across the Site as either Udorthents, or Urban Land, both of which indicate disturbed and/or filled urban areas. In this case, record soil data is available related to the stadium development and indicates significant deposits of coal ash that was presumably used to fill and flatten the Site.

Refer to report section 3.3.2.B.6 for information related to anticipated geotechnical exploration requirements for development of this site.

There do not appear to be any wetland resource areas or other environmentally sensitive areas on the Site itself, although the limit of the 100-year flood plain (FEMA mapping) reaches the south side of Chandler Street directly across from the Site. The flood plan is associated with Beaver Brook which exists as an open channel in the Beaver Brook parcel and presumably includes environmental resource areas including bordering vegetated wetland and Riverfront Area. There are no rare species (NHESP designated) habitats, or vernal pools on or directly adjacent to the Site.

Site Utilities

Water, sanitary sewer, and storm drain utilities are available in the public ways adjacent to the Site. Utilities in Chandler Street along the property frontage include 8" sanitary sewer mains, 10"/15"/48" storm drains, and three water mains. The water mains include a 24" low service main (installed 1883, cleaned and lined 1985) from which the existing building derives its water service, and a 42” low service main (installed 1914), and a 30” high service main (installed 1965).

A 15” combined sewer main and an 8” low service water main (installed 1986) are located in Abbott Street. Hydrant coverage for the Site is limited to hydrants located on Chandler Street.

In addition to the utilities located within the public ways, a large storm drain (the “Beaver Brook Culvert”) traverses the Site starting at the end of Coombs Road (a dead-end Street abutting the northwest corner of the Site) and crossing under Chandler Street just east of the Stadium Building. Record documents indicate that the drain is an 84” concrete pipe with relatively shallow cover.

2.1.2 Foley Site Development Concept

General

New Construction option on the Foley site would involve complete demolition of the existing stadium building, accessory buildings, athletic field/track and other athletic facilities. A new school building would be situated generally in the location of the existing stadium and field/track. New parking, access drives, site utility services, and athletic facilities would be also constructed. See Figure: “B.1 Foley Stadium”.

Access and Parking

The primary site access for a dedicated bus loop, and access to passenger vehicle parking facilities and an internal loop drive around the building would occur via two curb cuts on Chandler Street. Additional parking and a secondary vehicle access would be located on the portion of the parcel that connects to Abbott Street. Additional connections to adjacent streets are possible at the end of Coombs Road on the northwest portion of the Site, and at Norman Avenue on the northeast portion of the Site. The Norman Avenue connection would require acquisition of additional property. The total number of parking spaces currently proposed is 380 and the total paved area is roughly 5.6 acres.

The Site is located on a well-traveled “east-west” secondary road (Chandler Street - MA Route 122) and is located in close proximity to a well-traveled north-south secondary road (Park Avenue – MA Route 9/12). This condition is advantageous in terms of movement of passenger vehicles and buses to and from all areas of the Doherty Quadrant.

Earth Moving

Although the relatively flat terrain on the Site will be advantageous in terms of the overall earth moving operations, the presence of deleterious soil conditions (coal ash and other fill materials) is likely to require significant soil amendment and/or removal and disposal to construct the new school building, and any other structured facility on the site, possibly including some paved areas and athletic facilities.

Water Utilities

A new galvanized ductile iron water service main (1,800LF+) will be required to provide domestic water and fire protection services to the site. The new water service main would likely interconnect existing water mains from adjacent streets. Four to six new fire hydrants are likely to be required.

Sanitary Sewerage

Similar to other New Construction options, new sanitary sewer pipes and structures will be required including multiple building service connections, a dedicated kitchen service connection with an exterior grease trap vented to the building plumbing system, and dedicated drains for the covered parking area and any portion of the new building equipped to receive/store vehicles and/or gasoline-powered equipment. The latter dedicated service connections would also require gas/oil separators. All of the sanitary services will be connected to the existing municipal sewer main in Chandler Street.

Storm Drainage

In contrast to the development options on the existing Doherty site, redevelopment of the Foley site for the new school building and accessory uses would result in a significant increase in impervious site cover. The components of the stormwater management system that correspond to peak flow and groundwater recharge mitigation would be significant, relative to the overall scale and complexity of the overall system. These components would likely consist of several structured subsurface detention/recharge systems. Provisions for water quality treatment would also be required as under other site redevelopment options. Should the results of the geotechnical investigation conclude that the coal ash soil should be classified as a hazardous material, groundwater recharge requirements and corresponding systems would need to be designed to prevent subsurface flow through these soils.

The new building footprint will extend across the existing Beaver Brook Culvert noted in Section 2.1.1. This represents several significant constraints relative to building and site utility construction:

- If the building is constructed over the existing culvert, special foundation system construction necessary to structurally bridge the culvert will be required, and internal routing of building plumbing and mechanical systems could be affected;
- Redirecting the culvert to avoid conflicts with building construction represents a significant construction cost and phasing consideration;
- The shallow depth and relatively flat slope of the existing culvert is likely to constrain the configuration and routing of site utility systems including sanitary sewer, storm drain, and water distribution systems;
- Culvert condition is unknown and investigations to determine its condition and functionality would need to be included in future site investigations; and
- If the culvert were to be replaced or relocated, it would likely need to be installed on piles or other ground improvement system, all excavated soils would be subject to the conditions established by the geotechnical investigation.

Phasing

The project will not require special phasing considerations.

2.2 Option C.2 New Construction on Chandler Magnet School Site with Added Land

Nitsch Engineering conducted an existing site conditions and site development assessment of the Chandler Magnet School site to evaluate site features and characteristics that may affect new school construction on the site. The assessment was based on record information provided to us by the City of Worcester, presented in the City of Worcester's graphic information system (GIS) database, and presented in the Massachusetts Geographic Information System (GIS), and based on visual observations made during several site visits by Nitsch Engineering personnel.

2.2.1 Existing Site Conditions

Location and Configuration

The subject site (Site) is located at 525 Chandler Street in Worcester, MA. The associated parcel is listed as Worcester Assessor's Office Parcel Number 30-08A-00005 and includes approximately 22 acres (based on Assessor's data) and is owned by the City of Worcester School Department.

The Site is situated on the north side of Chandler Street, approximately just west of the intersection of Chandler Street and May Street with frontage on both streets. The frontage is interrupted by a small parcel at 301 May Street (single-family dwelling) and by a small parcel at 531 Chandler Street (vacant). The Worcester State University campus is located opposite the Site directly across Chandler Street.

The Site is configured in two sections including a triangular-shaped area generally bounded on two sides by Chandler and May Streets. This section is connected to a rectangular are to the north by a relatively narrow "neck" just over 200' wide.

Zoning, Easements, Restrictions

The Site is located within the RS-7 Residential zoning district; single & two-family residential dwelling district with 7,000sf minimum lot size. The existing school use is allowed by right in this district. No portion of the Site appears to be located within other zoning districts, historic districts, or other overlay districts.

There do not appear to be any easements, rights of way, historic registrations, or other encumbrances related to use on the Site, based on City of Worcester Assessor's data.

Existing Development

Approximately 11 acres of the Site is developed with the existing Chandler Magnet School, vehicle parking and access areas, pedestrian walks, and athletic/practice fields. The school building is situated on the triangular area on the south side of the property and the athletic fields are located on the lower portion of the rectangular property section to the north of the school.

The Site is accessed by three curb cuts on the north side of Chandler Street. The eastern-most curb cut provides access to a parking area and the two westerly curb cuts are an entrance and exit from a looped drive. A curb cut on May Street provides access to a parking lot and service yard for the existing school building.

Physical Characteristics

The Site includes two relatively flat areas that have been developed for the construction of the existing school building and the athletic fields, respectively. These two areas are separated in elevation by approximately 15 feet. The portion of the site west of the athletic fields is undeveloped woodland in a drumlin formation with slopes in some areas in excess of 25%.

Vegetation on the developed portion of the Site is completely cleared for lawn and turf, except for minor landscaped areas and several mature trees that remain from the pre-developed site.

The undeveloped areas of the site are vegetated with mature tree growth (mixed deciduous and coniferous) and moderate to thick undergrowth.

Based on National Resources Conservation Service (NRCS) data, the soils on most of the Site consist of Paxton soil. Paxton soil consists of glacial till and typically exhibits a shallow restrictive layer that can result in a seasonal perched water table and is classified as a Hydrologic Soil Group (HSG) C soil with relatively low permeability. In general, this soil type is not likely to represent a significant development constraint in terms of bearing capacity, workability, groundwater management, or erosion. Although disturbance of the currently undeveloped southern slopes of the Site could result in seasonal high groundwater management needs.

There do not appear to be any wetland resource areas or other environmentally sensitive areas on or within close proximity to the Site. There are no rare species (NHESP designated) habitats, or vernal pools on or directly adjacent to the Site. The Site is not within nor directly adjacent to any FEMA flood hazard areas.

Site Utilities

Water, sanitary sewer, and storm drain utilities are available in the public ways adjacent to the Site. Utilities in Chandler Street along the property frontage include a 24” sanitary sewer main, a 15”/18” storm drain, and two water mains. The water mains include a 24” low service main (installed 1883, cleaned and lined 1985) from which the existing building derives its water service, and a 48” low service main (installed 1914).

An 8” sanitary sewer main and a 10” storm drain are located in May Street beginning just south of the Site’s May Street frontage. Other sanitary sewer and storm drain pipes are present in May Street just north of the Site frontage, as referenced in the following paragraph. An 8” low service water main is also located in May Street. Hydrant coverage for the Site is limited to hydrants located on Chandler and May Streets.

In addition to the utilities located within the public ways, sanitary sewer and storm drain mains traverse the Site in two locations. According to City of Worcester utility records, a 10” sewer pipe and a 36” to 42” drain pipe crosses the Site from north to south, connecting sewer and storm mains in Ashmore Road and Moore Avenue to the corresponding utilities in Chandler Street. Additionally, a 10” sanitary sewer pipe and an 18” storm drain pipe connect the May Street utilities just north of the Site frontage to the corresponding mains that cross the Site from north to south.

2.2.2 Chandler Site Development Concept

General

Chandler Magnet Site Option C.2 includes the existing parcel plus added land acquired from abutting properties. This development option would involve complete demolition of the existing Chandler Magnet School, parking and access areas, and facilities. A new school building, new parking areas, access drives, site utility services, and athletic facilities would be constructed. The new building would be located somewhat to the north of the existing school building and would extend onto acquired land to the west. See Figure: “C.2 Chandler + Land”

Access and Parking

The Site is located on a well-traveled “east-west” secondary road (Chandler Street - MA Route 122), offering good access for passenger vehicles and buses. However, anecdotal information suggests that traffic conflicts with the day-to-day operation of Worcester State University could affect the school's access potential and/or that general traffic conditions in the vicinity of the school could be negatively affected by the expanded school use (relative to the existing Chandler Magnet School).

The site would be accessed by two curb cuts on May Street, and one curb cut on Chandler Street. The northern curb cut on May Street would be used by passenger vehicles to access the some of the parking facilities, athletic fields, and for student drop-off. The southern curb cut would be "entrance-only" and used by passenger vehicles to access the larger parking areas, and also for buses to enter the site to drop students off at the main entrance. Buses would exit the site onto Chandler Street. The Chandler Street curb cut would allow for entrances and exits from the site.

Earth Moving

Although extensive earth moving will be required to construct the project, it is possible that a soil export could be avoided. Roughly 900FT of moderately high retaining walls will be required to accommodate the spatial needs of the project.

Site Utilities

In general, the overall scale and scope of the site utility systems for Option C.2. would be similar to those described for the New Construction Options at the Doherty Site with the added constraint/condition of the existing storm drain and sanitary sewer utilities that traverse the site as described in Section 2.2.1 above. The existing storm drain and sanitary sewer pipes and structures would need to be re-routed to facilitate building and site construction.

Nitsch Engineering

Traffic Assessment Memorandum

Doherty Memorial High School Feasibility Study

Worcester, MA

December 11, 2019

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Nitsch Engineering Project #13325.

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INTRODUCTION

As part of the Feasibility Study for the Doherty Memorial High School project located in Worcester, Massachusetts, has been retained by Lamoureux Pagano Architects (LPA) to observe the existing traffic circulation and queue lengths on adjacent streets during drop-off and pick-up periods at the existing Doherty Memorial High School, and assess the five (5) site improvement options presented by LBA. The five options include:

A.1 Pods on Park, new construction at existing Doherty High School site;
A.2 Olmstead Homage, new construction at existing Doherty High School site;
A.3 Highland Proud, new construction at existing Doherty High School site;
B.1 New construction on Foley Stadium Site; and
C.2 New construction on Chandler Magnet School Site.

Nitsch Engineering conducted a site visit to observe the existing traffic circulation and queue lengths on adjacent streets during drop-off and pick-up periods, as well as the parking utilization at the existing Doherty Memorial High School.

Nitsch Engineering also compiled and reviewed existing traffic data from Chandler Street Improvement Project (Prepared by VHB, October 18, 2016), which was provided by the Worcester Department of Public Works. The information was used to provide a qualitative assessment of the potential traffic impacts of the proposed high school in the surrounding area if the Chandler Magnet School site was selected.

Because this assessment focuses strictly on the issues above, traffic operations are secondary to the goals of the report and therefore we did not collect Automatic Traffic Recorder (ATR) counts or Turning Movement Counts (TMC) and evaluation of roadway and intersection capacity analyses and traffic signal warrants was not performed.

Doherty Memorial High School Site Visit

Nitsch Engineering conducted a site visit on Wednesday, May 22, 2019, to observe the site circulation associated with the weekday morning drop-off, weekday afternoon pick-up, and general queue lengths around the school site. The observation occurred during sunny conditions with a temperature of 70 degrees.

Doherty Memorial High School Site Access and Egress

Doherty Memorial High School is located at 299 Highland Street in Worcester, Massachusetts. The school is accessed using three curb cuts on Highland Street. The easternmost curb cut provides access to the two main parking lots at the school. The other two curb cuts provide access to the main office, the visitor parking and a third parking lot. They also are used mainly for the bus drop-off and pick-up.

Doherty Memorial High School Traffic Circulation and Pick-up/Drop-off

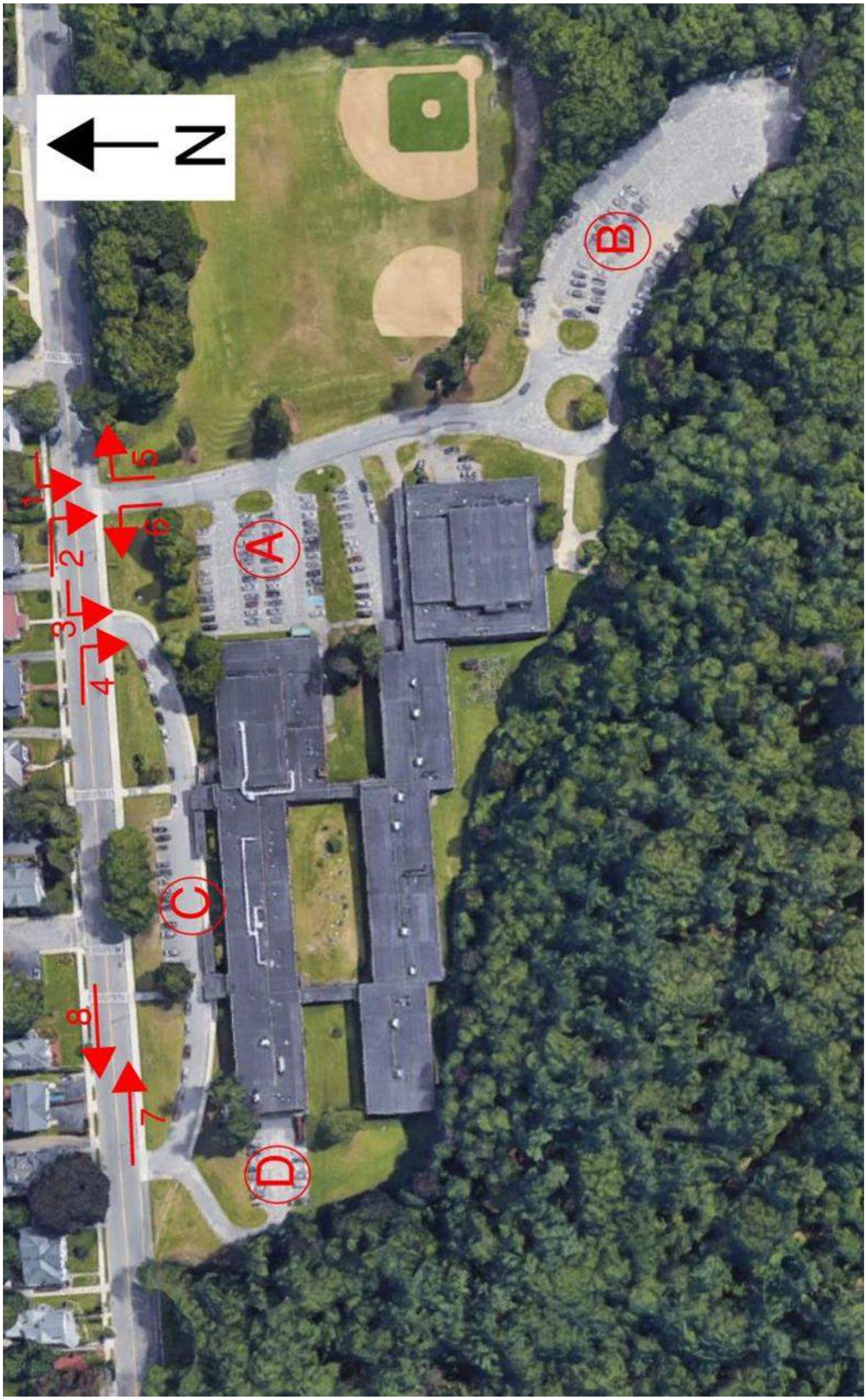
Please refer to the map for actual count locations.

Table 1 – Doherty School Drop-Off Quantity

Time / Movement	1	2	3	4	5	6	7 (Drop-off)	8 (Drop-off)
6:45 AM 7:00 AM	35	13	16 (2 Buses)	18 (5 Buses)	5	0	18	45
7:00 AM 7:15 AM	85	28	43 (6 Buses)	13 (1 Bus)	26	0	0	8
7:15 AM 7:30 AM	43	17	23 (0 Bus)	12 (0 Bus)	16	0	14	8
7:30 AM 7:45 AM	5	1	7 (0 Bus)	4 (0 Bus)	2	0	0	2
TOTAL	**168**	**59**	**87 (8 Buses)**	**41 (6 Buses)**	**49**	**0**	**32**	**63**

Table 2 – Doherty School Pick-Up Quantity

Time / Movement	1	2	3	4	5	6	7 (Pickup)	8 (Pickup)
1:15 PM 1:30 PM	2	2	7 (6 Buses)	2 (0 Bus)	3	3	19	8
1:30 PM 1:45 PM	5	3	6 (2 Buses)	1 (0 Bus)	4	0	27	21
1:45 PM 2:00 PM	0	0	1 (0 Bus)	2 (0 Bus)	40	1	40	35
2:00 PM 2:15 PM	1	3	0 (0 Bus)	2 (0 Bus)	40	19	6	3
TOTAL	**7**	**8**	**14 (8 Buses)**	**7 (0 Buses)**	**87**	**23**	**92**	**67**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Existing Morning Drop-off Circulation:

The Doherty Memorial High School traffic arrives at Highland Street from 6:45 AM through 7:45 AM. The parents arrive at Highland Street from east and west to drop-off their students along the curb on both sides of Highland Street.

Buses arrive at the main entrance driveway through Highland Street to drop-off students from 6:45 AM through 7:15 AM. A total of fourteen buses drop off students at the school.

Existing Afternoon Pick-up Circulation:

The Doherty Memorial High School traffic arrives at Highland Street from 1:15 PM through 2:15 PM. The parents arrive at Highland Street from east and west and park along the curb on both sides of Highland Street and wait to pick-up their students. We observed queue lengths of approximately 900 feet on both sides of Highland Street during the afternoon pick-up time.

Buses arrive at the main entrance driveway through Highland Street to pick-up students from 1:00 PM through 1:45 PM. A total of fourteen buses pick-up students at the school.

Doherty Memorial High School Parking Supply and Demand

Nitsch Engineering performed a parking supply and demand count on May 22, 2019. The utilization of the lots was taken at 9:30 AM.

Lot A (Faculty/Student)
Total Spaces:84 - Occupied: 79
Accessible: 1(empty)
Note: 12 cars were parked illegally.
Utilization: 107%

Lot B (Student)
Total Spaces:131 - Occupied: 120
Accessible: None
Note: 5 cars were parked illegally, and 5 others were parked behind the building.
Utilization: 99%

Lot C (Faculty/Staff)
Total Spaces:16 - Occupied: 12
Accessible: None
Utilization: 75%

Lot D (Faculty/Staff)
Total Spaces:18 - Occupied: 18
Accessible: None
Note: No pavement markings
Utilization: 100%

Assessment of the Options

Five (5) site improvement options are presented by LBA for Doherty Memorial High School. The five options include:

- Highland Proud, new construction at existing Doherty High School site;
- Olmstead Homage, new construction at existing Doherty High School site;
- Pods on Park, new construction at existing Doherty High School site;
- New construction on Chandler Magnet School Site; and
- New construction on Foley Stadium Site.

Nitsch Engineering reviewed the Site Plans for the above options with attention to traffic-related elements which included:

- On-site circulation;
- Pick-up/drop-off locations;
- On-site vehicle queuing; and
- Site access driveway locations and conflict points.

A.1 Pods on Park, located at existing Doherty High School

The proposed site plan was designed to optimize traffic flow and safety. Given the location of the bus pick-up/drop-off at the main school entrance, buses will circulate counterclockwise through the site to the Drop-off/pick-up area. Busses will enter from Highland Street using the driveway in the north, proceed south to turn left into the bus drive aisle and exit to Highland Street via the same driveway in the north. Given the designated dumpster and loading dock locations, it is expected that the delivery/trash trucks will circulate counterclockwise around the school building. Trucks will enter from Highland Street using the westernmost driveway in the north, circulate counter-clockwise to the rear of the building, and exit to Highland Street via the easternmost driveway in the north.

The separation of bus and parental traffic at the pick-up/drop-off location at the main entrance to the school allows buses to queue without impeding car circulation.

Given the location of passenger car pick-up/drop-off at the main school entrance at the west of the school building, it is expected that cars will enter the site from Highland Street through the westernmost driveway in the north and circulate counter-clockwise north of the playfields and underground parking and around the surface parking lot to the north driveway to exit to Highland Street. The Massachusetts Department of Transportation provides traffic data for roadways around the Commonwealth. According to the most recent data, Highland Street carries approximately 22,800 vehicles per day which is considered an average-volume traffic road and as such, conflicts are not expected for vehicles turning in and out of the school during peak hours.

A.2 Olmstead Homage, located at existing Doherty High School

Given the location of the bus pick-up/drop-off at the main school entrance, buses will circulate counterclockwise through the site and around the playfields and underground parking lot to the building. Busses will enter from Highland Street using the westerly driveway in the north, which is shared with the passenger vehicles, proceed south to turn left into the main drive aisle and exit to Highland Street via the driveway in the north. Given the designated dumpster and loading dock locations, it is expected that the delivery/trash trucks will circulate counterclockwise around the school building. Trucks will enter from Highland Street using the westernmost driveway in the north, circulate counter-clockwise to the rear of the building, and exit to Highland Street via the easternmost driveway in the north.

Given the location of passenger car pick-up/drop-off at the main school entrance at the west of the school building, it is expected that cars will enter the site from Highland Street through the same westernmost driveway in the north as the buses and circulate counter-clockwise around the parking lot back to the north driveway to exit to Highland Street. The Massachusetts Department of Transportation provides traffic data for roadways around the Commonwealth. According to the most recent data, Highland Street carries approximately 22,800 vehicles per day which is considered an average-volume traffic road and as such, conflicts are not expected for vehicles turning in and out of the school during peak hours.

A.3 Highland Proud, located at existing Doherty High School

The proposed site plan was designed to optimize traffic flow and safety. Given the location of the bus pick-up/drop-off at the main school entrance, buses will circulate counterclockwise through the site to the building. Busses will enter from Highland Street using the Bus Only driveway in the north, proceed south to turn left into the main drive aisle and exit to Highland Street via another Bus Only driveway in the north. Given the designated dumpster and loading dock locations, it is expected that the delivery/trash trucks will circulate counterclockwise around the school building. Trucks will enter from Highland Street using the westernmost driveway in the north, circulate counter-clockwise to the rear of the building, and exit to Highland Street via the easternmost driveway in the north.

The pick-up/drop-off location for the buses at the main entrance to the school allows buses to queue without impeding car circulation.

Given the location of passenger car pick-up/drop-off at the secondary school entrance at the west of the school building, it is expected that cars will enter the site from Highland Street through the westernmost driveway in the north and circulate counter-clockwise around the parking lot back to the north driveway to exit to Highland Street. The Massachusetts Department of Transportation provides traffic data for roadways around the Commonwealth. According to the most recent data, Highland Street carries approximately 22,800 vehicles per day which is considered an average-volume traffic road and as such, conflicts are not expected for vehicles turning in and out of the school during peak hours.

B.1 New construction on Foley Stadium Site

The proposed site plan was designed to optimize traffic flow and safety. Given the location of the bus pick-up/drop-off at the main school entrance, buses will circulate counterclockwise through the site to the Drop-off/pick-up area. Busses will enter from the south on Chandler Street using the driveway in the east, proceed north to turn left into the bus drive aisle and exit south to Chandler Street via the driveway in the west. Given the designated dumpster and loading dock locations, it is expected that the delivery/trash trucks will circulate counterclockwise around the school building. Trucks will enter from the south on Chandler Street using the driveway in the east, circulate counter-clockwise to the rear of the building, and exit south to Chandler Street via the driveway in the east.

The separation of bus and parental traffic at the pick-up/drop-off location at the main entrance to the school allows buses to queue without impeding car circulation.

Given the location of passenger car pick-up/drop-off at the main school entrance, it is expected that cars will enter the site from the south on Chandler Street using the driveway in the east and circulate counterclockwise around the school building and surface parking lot to exit south to Chandler Street via the driveway in the west. The Massachusetts Department of Transportation provides traffic data for roadways around the Commonwealth.

Nitsch Engineering used the Institute of Transportation Engineers (ITE) publication *Trip Generation*, 10th Edition to estimate the vehicle trip rates for the proposed high school, and to compare the rates with the existing Chandler Magnet School trip rates should that site be selected for the new high school. Trip generation rates for the high school were based on the Land Use Code (LUC) 530 (High School).

Table 3 - Site Generated Trips

Time	**Proposed High School (LUC 530)**
Weekday Daily	3130
Entering	1565
Exiting	1565
Weekday Morning Peak	848
Entering	577
Exiting	271
Weekday Evening Peak	509
Entering	163
Exiting	346

According to the most recent data, Chandler Street carries approximately 14,650 vehicles per day. This is considered a low to an average-volume traffic road. However, as illustrated in Table 3, should the Foley Stadium be the selected site for the proposed Doherty High School, the new school will generate approximately 3130 additional daily trips (1565 trips in and 1565 trips out), with 848 additional trips (577 trips in and 271 trips out) during the weekday morning drop-off time and 509 additional trips (163 trips in and 346 trips out) during the weekday afternoon pick-up time. These results indicate that the proposed Doherty High School at the existing Foley Stadium site would place significant additional vehicular congestion at Chandler Street (approximately 25% increase in daily traffic volumes).

C.2 New construction on Chandler Magnet School Site

The proposed site plan was designed to optimize traffic flow and safety. Given the location of the bus pick-up/drop-off at the main school entrance, buses will circulate clockwise through the site to the Drop-off/pick-up area. Busses will enter east using the southern driveway on May Street, proceed west to the bus drive aisle then turn left to exit Chandler Street. Given the designated dumpster and loading dock locations, it is expected that the delivery/trash trucks will circulate counterclockwise around the school building. Trucks will enter from the east using the northern driveway on May Street, circulate counter-clockwise to the rear of the building, and exit to Chandler Street in the south.

The separation of bus and parental traffic at the pick-up/drop-off location at the main entrance to the school allows buses to queue without impeding car circulation.

Given the location of passenger car pick-up/drop-off at the main school entrance, it is expected that cars will enter the site from the east using the northern driveway on May Street and circulate counter-clockwise around the school building to the south driveway to exit to Chandler Street.

Nitsch Engineering used the Institute of Transportation Engineers (ITE) publication *Trip Generation*, 10th Edition to estimate the vehicle trip rates for the proposed high school, and to compare the rates with the existing Chandler Magnet School trip rates should that site be selected for the new high school. Trip generation rates for the high school were based on the Land Use Code (LUC) 530 (High School). Trip generation rates for the elementary school were based on LUC 520 (Elementary School).

Table 4 - Site Generated Trips

Time	Proposed High School (LUC 530)	Existing Elementary School (LUC 520)	New Trips
Weekday Daily	3130	983	2147
Entering	1565	491	1074
Exiting	1565	492	1073
Weekday Morning Peak	848	317	531
Entering	577	171	406
Exiting	271	146	125
Weekday Evening Peak	509	166	343
Entering	163	75	88
Exiting	346	91	255

As illustrated in Table 4 the proposed Doherty High School at the existing Chandler Magnet School site would result in approximately 2147 additional daily trips (1074 trips in and 1073 trips out), with 531 additional trips (406 trips in and 125 trips out) during the weekday morning drop-off time and 343 additional trips (88 trips in and 255 trips out) during the weekday afternoon pick-up time. Reviewing these results with the traffic volumes from Chandler Street Improvement Project indicates that the proposed Doherty High School at the existing Chandler Magnet School site would place significant additional vehicular congestion at both Chandler Street at May Street intersections. Also, the High School has approximately 700 to 800 students that walk to the school. This, in turn, will add to the pedestrian congestion at the crosswalks at these intersections, and the midblock crossing on Chandler Street near the existing Chandler Magnet School.

Assessment

Nitsch Engineering has developed the following evaluation matrix based on the above observations.

Site	Option	Pros	Cons
Existing Doherty High School Site	A.1 Pods on Park - Remove Existing, Build New	• Opportunity to improve onsite flow. • Opportunity to improve the safety at the Drop-off area. • Partial separation of cars and buses. • Opportunity for Additional Parking.	• On-street pick-up/drop-off may continue.
	A.2 Olmsted Homage - Remove Existing, Build New	• Opportunity to improve onsite flow. • Opportunity for Additional Parking.	• On-street pick-up/drop-off may continue. • No separation of cars and buses. • Parental drop-off/pick-up in the middle of the parking lot; • Reduction of play areas.
	A.3 Highland Proud - Remove Existing, Build New	• Opportunity to improve onsite flow. • Opportunity to improve the safety at the Drop-off area. • Opportunity for Additional Parking. • Complete separation of cars and buses. • Improved internal circulation.	• On-street pick-up/drop-off may continue. • Four curb-cuts. • Reduction of play areas.
Foley Stadium Site	B.1 Foley Site - Remove Existing Stadium, Build New High School	• Improved onsite flow. • Opportunity to improve the safety at the Drop-off area. • Opportunity for Additional Parking. • Complete separation of cars and buses. • Improved internal circulation.	• Additional traffic; • Side streets may be used for drop-off and pick-up activities.
Chandler Magnet School Site	C.2 Chandler Site - Remove Existing School, Build New High School	• Improved onsite flow. • Opportunity to improve the safety at the Drop-off area. • Opportunity for Additional Parking. • Partial separation of cars and buses. • Improved internal circulation.	• Additional traffic; • School traffic during drop-off and pick-up may overlap with Worcester State University traffic. • Side streets may be used for drop-off and pick-up activities.

Conclusions and Recommendations

As part of the Feasibility Study for the Doherty Memorial High School project located in Worcester, Massachusetts, has been retained by Lamoureux Pagano Architects (LPA) to observe the existing traffic circulation and queue lengths on adjacent streets during drop-off and pick-up periods at the existing Doherty Memorial High School, and assess the five (5) site improvement options presented by LBA. The five options include:

A.1 Pods on Park, new construction at existing Doherty High School site;
A.2 Olmstead Homage, new construction at existing Doherty High School site;
A.3 Highland Proud, new construction at existing Doherty High School site;
B.1 New construction on Foley Stadium Site; and
C.2 New construction on Chandler Magnet School Site.

Existing Doherty High School Site

Based on our observation we believe that the three options of a new high school at the existing Doherty High School site will provide additional on-site parking and extended queue space tor adequately address internal parental circulation. However, the student drop-off and pick-up activities may continue to occur on both sides of Highland Street as well. For the safety of the student crossing the street, a high-intensity Rectangular Rapid Flashing Beacon (RRFB) may need to be installed at the main crosswalk across Highland Street to make drivers more aware of the students and pedestrian at the crosswalk. Also, the additional student population at the proposed school may place additional vehicular congestion at the intersection of Highland Street at Park Avenue as well as the Highland Street at Pleasant Street, June Street, and Newton Avenue roundabout. The full traffic report for the new school, should the existing site be selected, will include analysis of theses intersections and provide suitable mitigation measures.

The school should also consider reaching out to parents via social media to increase safety awareness.

Foley Site

The average daily trips along Highland Street may be reduced by as much as 3130 trips per day if the proposed high school is moved from its existing site to either the Chandler Magnet School site or the Foley Stadium site. However, this reduction will only apply to the morning peak hours, since the evening commuter and high school traffic peak hours do not coincide.

Should the proposed Doherty High School be moved to the existing Foley Stadium site, it would place additional vehicular congestion at Chandler Street (approximately 25% increase in daily traffic volumes), which in turn may have an impact at the intersection of Highland Street and Park Avenue as well as the intersections of Pleasant Street at Park Avenue, and Chandler Street at June Street. Also, some parents might opt to drop-off and pick-up their students at the neighborhood streets around the school to avoid traffic congestion. If the impacts are found to be significant, mitigation measures will be required. The mitigations may include:

- New traffic signals and/or retiming the existing ones;
- Roadway improvement measures;
- Regulation changes to the side streets;
- Speed limit reduction; and
- Traffic calming measure.

However, the magnitude of these impacts and the suitable mitigation measures cannot be independently estimated without fully analyzing the intersections as part of a full traffic study.

Chandler Site

Similar to the Foley Site, Should the proposed Doherty High School be moved to the existing Chandler site, it may place additional vehicular congestion at Chandler Street, and at both Chandler Street at May Street intersections, which, if significant, will require mitigation measures similar to the Foley Site. However, again the magnitude of these impacts and the suitable mitigation measures cannot be independently estimated without fully analyzing the intersections as part of a full traffic study. The study will include pedestrian and vehicular access, intersection analysis, site distance analysis, and review of traffic signal warrants to install new or upgrade existing traffic control signals.

General Information

We have reviewed the four general design options presented for the Doherty Memorial High School feasibility study by Lamoureux Pagano and Associates, and offer the following description of each structural system. Also, we will present the basic structural scope and implications of each design option. The design options are:

1. Code Upgrade
2. Renovation and Addition
3. New Construction on Existing Site (Options A.1, A.2 & A.3)
4. New Construction on Alternate Sites (Options B.1 & C.2)

1. Code Upgrade

The "Code Upgrade" option includes completing regular building maintenance, repairing/replacement of existing building systems that have reached their life expectancy or failed, and addressing pre-existing building code violations. Maintenance and updating building systems will be completed with fixtures that serve the same purpose. The "Code Upgrade" option will need to conform to Level 1 Work of the International Existing Building Code, 2015 Edition, as modified by the Massachusetts State Building Code, Ninth Edition.

Existing Structural Systems:

The two-story buildings consist of:

- Foundations:
    - 16" Concrete frost walls (2-#6 T&B) with continuous 2'-4" wide footing.
    - 12" Concrete retaining walls with continuous 5'-0" wide footing at South walls of buildings to resist stepped soil conditions.
    - Spread footings below columns, designed for soil bearing pressure of 6,000 psf.
    - Interior concrete walls (2-#6 T&B) below CMU partitions 8" and wider.
- Columns:
    - Steel tube columns. TS4x4, TS5x5, TS6x6 and additional rectangular sizes.
    - Wide flange steel columns. W6's, W8's & W10's.
- Floors (at grade):
    - 4" Concrete slab-on-grade at classrooms and common spaces.
    - 6" Concrete slab-on-grade at mechanical room.
- Walls
    - Interior walls are unreinforced concrete masonry units (CMU) at corridors, select interior partitions, and at perimeter of Gymnasium, Auditorium, and Mechanical Rooms.
    - Exterior walls are unreinforced CMU with brick veneer, or insulated wall panels.
    - Select interior partitions are metal studs with plaster.
- Floors (framed):
    - 2 ½" & 3" Concrete slab on metal form deck with 6x6 welded wire fabric at Classrooms.
    - 4" Reinforced structural concrete slabs reinforced with #3's at second floor area surrounding the gymnasium.
    - 6" Reinforced structural concrete slabs reinforced with #3's at connector bridges.
    - Joists: Classroom floors are typically framed with 16J & 18J Joists spaced at 24" o.c.
    - Beams: Non-composite W-beams (Typically W14's and W16's @ 2'-0" o.c. spanning 28 feet). Beams at the floors are typically located on column lines, corridors, or other non-repetitive framing layouts.

    - Girders: Non-composite W-beams (Typically W14's & W16's spanning 16 feet). Girders over Cafeteria are W24's.
- Roof:
    - Steel wide flange beams on column lines, corridors, and at non-typical bays.
    - Steel roof joists at framing infill between column lines (16J joists @ 4'-0" o.c.)
    - Long-span steel roof joists at Auditorium and Cafeteria roofs.
    - Long-span steel beams (W36's) with steel beam infill at Gymnasium roof.
    - Steel roof deck (1 ½" metal roof deck).
    - Insulated plank decking on bulb tees at Gymnasium roof.
    - Flat plate diagonal strapping for lateral forces (Typically 3"x ¼").
- Bracing:
    - Steel bracing towers at several column lines at each building Unit. Bracing towers are constructed with steel plates and steel rods.

Structural Scope:
The structural scope of the Code Upgrade option is fairly limited and will consist of correcting pre-existing Code violations and general repairs. Structural work will include:

- Seismic anchorage of interior CMU partitions built to the underside of floor/roof framing will need to be reviewed. Partitions and other walls built up to the underside, and not around, the steel members will need new anchorage or seismic clips to restrain the walls during a seismic event.
- Replacing deficient mechanical systems will include replacing equipment with similar equipment. The weights should remain unchanged, but should new, or heavier, equipment be required, the structural capacity of existing framing would need to be reviewed.
- Regular maintenance to the structure will include repointing of masonry veneer, re-caulking brick expansion joints, and painting steel lintels. Most of the brick veneer appears sound and stable, so maintenance would be limited to select locations only. Masonry infill will be required at several locations where mechanical openings were abandoned and infilled with wood framing.
- Roofing replacement is not anticipated, but if more than 50% of the roofing is replaced, the roof diaphragm will need to be investigated for resisting wind loads. Generally, most of the school roof consists of steel framing and a metal roof deck diaphragm, which appears to be adequate for resisting winds loads. The Gymnasium roof is framed differently, consisting of steel framing and insulated plank decking on bulb tees. The insulated plank on bulb tees typically do not resist diaphragm loads adequately, and will need to be investigated if the roofing is replaced. A possible solution may include removing the insulated panel system and replacing with metal roof decking and a traditional insulated roof system over the metal decking.

Comments: As part of the "Code Upgrade" option, the building will not be re-roofed, except at select locations where roof deck repair is required. Existing mechanical/electrical equipment will be repaired, or replaced with similar equipment. The structural scope of work will be fairly limited through most of the building and will likely need to comply with Level 1 Work, per the Building Code. As part of Level 1 Work, masonry parapets and masonry wall anchorage need to conform to the International Existing Building Code. Based on our review, there are no masonry parapets that need to be corrected, and the roof diaphragm appears to be connected to the exterior framing. Interior masonry partitions will need to be secured to the floor/roof framing to conform to the seismic code.

The building will continue to perform as currently used, but due to lack of renovation, addition, or additional structural improvement, the "Code Upgrade" option will limit future flexibility, such as, modifying room sizes. Also, since the building will be undergoing regular maintenance as part of the

"Code Upgrade" option, we recommend general repair of exterior masonry joints and repointing the brick at deteriorated locations.

2. Renovation and Addition

The "Renovation and Addition" option includes partial demolition of the existing building (77,500 ft^2), renovation of the existing building (98,00 ft^2), and a structurally isolated addition (322,000 ft^2) for a finished building of 420,000 ft^2. Due to the substantial renovation work involved within the existing building, the renovation portion of the "Renovation and Addition" options will need to conform to the International Existing Building Code for Level 3 Work, as modified by Chapter 34 of the Massachusetts State Building Code. The new construction portion of the project will need to conform to the current International Building Code, as modified by the Massachusetts State Building Code.

Existing Structural Systems:

- Structural systems of the existing building are similar to "Code Upgrade" option

New Addition Structural Systems:

- Additions will be seismically isolated from the existing building by installing building expansion joints.
- Foundations:
    - Interior concrete spread footings
    - Continuous reinforced concrete frost wall and footing at exterior walls at level site areas.
    - Concrete retaining walls and possibly concrete buttress walls at sloped site conditions.
- Columns:
    - Wide flange steel columns (W8 & W10)
- Framed Floors:
    - Wide flange composite steel beams.
    - Composite metal deck.
    - Concrete fill (light-weight concrete at fire-rated slabs).
- Roof:
    - Wide flange steel beams.
    - Long-span steel trusses and joists at open areas.
    - Metal roof deck
- Lateral Force Resisting System:
    - Concentrically braced steel frames.

Structural Scope at Existing Buildings:

- Seismic anchorage of interior CMU partitions must be reviewed similar to the "Code Upgrade" option.
- Support of new or replaced rooftop mechanical equipment will be similar to the "Code Upgrade" option.
- Complete regular maintenance at exterior envelope, including: re-pointing veneer, painting lintels, and caulking brick expansion joints.
- The proposed scope of demolition includes the existing Cafeteria/Kitchen, the west end of the upper Classroom Building, and the Gymnasium/Engineering Building. Due to the significant changes to the existing building, the remaining portions of the building will need to be fully reviewed for seismic load resistance in accordance with the Building Codes. We anticipate adding new seismic force-resisting elements throughout the existing building to

comply with the current Building Code requirements. New elements may include steel bracing towers, or reinforced concrete masonry unit (CMU) shear walls. Typically, the bracing would be HSS tubes located at corridor walls and demising walls between classrooms. The installation will require attaching new plates to existing columns, beams, and foundations for the tube bracing.

Comments: From a structural point of view, the “Renovation and Addition” option is the most involved due to the significant renovation of the existing building, phasing of construction, and the integration of the new construction. At a minimum, the existing building will need to be brought into compliance with the International Existing Building Code, as modified by Chapter 34 of the MSBC to increase basic life safety to the minimum requirements of the Code. We anticipate structural modifications to the existing building will be required due to the proposed renovation. Structural modifications will likely include redesigning the seismic bracing systems to resist current seismic loads, providing support for new mechanical systems, and laterally supporting existing masonry partitions.

It should be noted that the renovation will increase the life safety of the existing building, but it will not fully bring the existing building up to standards of the current Building Code due to lesser quality materials and design practices used at the time of original construction. Also, even though the renovation will extend the life of the existing building, the building should not be expected to last as long or perform as well as the newly constructed additions or a new building. Similar to the “Code Upgrade” option, the brick veneer will need to be repointed at deteriorated locations. Other water damage or deteriorated conditions may be discovered after finishes are removed for renovation and will need to be corrected at that time.

3. New Construction on Existing Site (Options A.1, A.2 & A.3)

The “New Construction on Existing Site” options consist of building an entirely new 420,000 ft^2 school on the same site as the existing school. The construction will take place while the existing school remains in use. The school will consist of a multi-story core area and multi-story classroom wings. The building will use standard construction methods and materials.

Structural Systems:

- Options A.1 & A.3 provide standard building layout with the large open floor plans (Auditorium & Gymnasium) located at grade.
- Option A.2 provides parking at the lowest level of the building with the Auditorium located above the parking area.
- Foundations:
  - Interior concrete spread footings
  - Continuous reinforced concrete frost wall and footing at exterior walls at level site areas.
  - Concrete retaining walls and possibly concrete buttress walls at sloped site conditions.
  - Foundation systems are assumed based on existing conditions and must be verified by a qualified Geotechnical Engineer.
- Columns:
  - Steel tube columns (HSS6x6 & HSS7x7) at 1 & 2-story portions of the building.
  - Wide flange steel columns (W8 & W10) at 3 & 4-story portions of the building.
- Framed Floors:
  - Wide flange composite steel beams
  - Composite metal deck

    - Concrete fill
- Walls:
    - Light gauge framing will be used at interior partitions and exterior walls.
    - Reinforced CMU will be used at elevator shafts, locker rooms, gymnasium, and other high-abuse areas.
- Roof:
    - Wide flange steel beams
    - Metal roof deck
    - Designed to support photovoltaic panels.
- Lateral Force Resisting System:
    - Concentrically braced steel frames.

Comments: The “New Construction on Existing Site” Options A.1 & A.3 are flexible options, from a structural point of view. Option A.2 provides flexibility since it is new construction, but the parking located below the proposed Auditorium will require compromises with either the Auditorium column layout or the parking layout around the columns. All three options will also allow for increased life safety and more flexibility for sustainable design, relative to the “Code Upgrade” or “Renovation and Addition” options. Construction materials and systems will be designed in compliance with the current Massachusetts State Building Code.

4. New Construction on Alternate Site (Options B.1 & C.2)

The “New Construction on Alternate Site” options consist of building an entirely new 420,000 ft^2 school on either the Foley Stadium Site (B.1) or the Chandler Magnet Site (C.2). The construction will take place at an alternate site and will not affect the use of the existing school. Similar to the “New Construction on Existing Site” Options, the new school will consist of a multi-story core area and multi-story classroom wings. The building will use standard construction methods and materials.

Structural Systems:

- Foundations (Option B.1- Foley Stadium Site):
    - Existing test pits indicate up to 12 feet of coal ash and urban fill over peat.
    - Deep foundation system using piles.
    - Reinforced concrete grade beams at exterior walls and throughout building.
    - Structural concrete slab at grade level supported on grade beams and piles.
    - Foundation systems are assumed based on existing test pit information and must be verified by a qualified Geotechnical Engineer.
- Foundations (Option C.2- Chandler Magnet Site):
    - Interior concrete spread footings
    - Continuous reinforced concrete frost wall and footing at exterior walls at level site areas.
    - Concrete retaining walls and possibly concrete buttress walls at sloped site conditions.
    - Foundation systems are assumed based on existing conditions and must be verified by a qualified Geotechnical Engineer.
- Columns:
    - Steel tube columns (HSS6x6 & HSS7x7) at 1 & 2-story portions of the building.
    - Wide flange steel columns (W8 & W10) at 3 & 4-story portions of the building.
- Framed Floors:
    - Wide flange composite steel beams
    - Composite metal deck
    - Concrete fill

- Walls:
  - Light gauge framing will be used at interior partitions and exterior walls.
  - Reinforced CMU will be used at elevator shafts, locker rooms, gymnasium, and other high-abuse areas.
- Roof:
  - Wide flange steel beams
  - Metal roof deck
  - Designed to support photovoltaic panels.
- Lateral Force Resisting System:
  - Concentrically braced steel frames.

Comments: The “New Construction on Alternate Site” options offer a flexible option, from a structural point of view. These options will also allow for increased life safety and more flexibility for sustainable design, relative to the “Code Upgrade” or “Renovation and Addition” options. Construction materials and systems will be designed in compliance with the current Massachusetts State Building Code.

The most significant difference between the two site appears to be the existing sub-grade soil conditions. The Chandler Magnet Site appears to be located on dense sand/clay/gravel, likely allowing the use of typical shallow foundations, similar to the existing site. The Foley Stadium site appears to be located on coal ash, urban fill, and peat and will require deep foundations with structural concrete framing at the first floor due to the poor existing site conditions. Assumptions will need to be confirmed by a qualified Geotechnical Engineer, who will also need to provide design recommendations and site preparation requirements.

Conclusions:
We have reviewed the four design options and it our professional opinion that all four options are structurally feasible. The “Code Upgrade” option requires very few structural modifications due to the limited nature of the work. Minor structural work will be required to address the interior partitions and general deterioration of the building. The “Renovation and Addition” option will require demolishing a portion of the building and building a significant addition. Completing this work will require structural modifications to install building expansion joints and installing new seismic bracing within the remaining portion of the building. The addition will be structurally isolated to avoid impacting the existing building. The “New Construction” options are fairly straight forward; a new 420,000 ft^2 school will be constructed on either the same site adjacent to the existing school, or a new site at Chandler Magnet School or Foley Stadium. The Foley Stadium site is located on poor quality soil and will likely require deep foundations, structural concrete framing at the lowest level, and significant site maintenance to deal with poor soil during construction. The “New Construction” options provide the most flexibility, from a structural point of view, allowing the school construction to conform to the full extent of the current Building Code, but may not be as cost effective as the “Renovation and Addition” option.

Prepared by: Christopher Tutlis, President

3.3.3 D 1. d.

Doherty High School - Worcester, Ma.
Fire Protection - Final Evaluation of Alternatives

12-11-19

EXECUTIVE SUMMARY

The purpose of this study is to evaluate the need, feasibility and cost-impacts of adding a fire-protection (FP) sprinkler system to either the existing (renovated) building, or to a newly constructed building on one of 3 possible sites (existing site, Foley Stadium site, or Chandler Magnet School site).

The existing building structure, layout, and various hazard levels were summarized in the FP existing conditions report (dated 6-25-19). The FP PDP report (dated 8-28-19) noted available street water flow and pressure at the existing Doherty site as “good” (80 psi static, 75 psi residual, 1690 gpm flowing), but in need of current confirmation – since it was 12 years old.

We have since received flow test data near the 2, alternate, Chandler St sites. This data also needs to be confirmed, due to the age of the tests. As would be expected from a 24” street main, flow is very good at both sites - around 1,500 gpm.

Available pressure at the Foley site is even better than at the existing High School 93 psi static, 89 psi lower residual. The Chandler Magnet school site has the lowest available pressure of the 3 sites – roughly 60 psi static, 55 psi residual – explained by it’s much higher elevation compared to the other 2 sites.

It is important to note that all 3 sites have steep terrain, and will require a 4 (or more)-story academic wing because of the relatively small buildable area at each site. Under these conditions, a significant portion of the available pressure is “used up” just raising the water to the highest-level sprinklers. This is summarized in Table 1 below.

TABLE !

Location	New Construction Option	Available Static PSI	Available Static at Highest Sprinklers - PSI	Fire Pump Required for Spr.?	Fire Pump Required for Standpipe?
Existing Site	A.1	80	39.7	Can be avoided with larger than normal piping.	Yes, Due to "high-rise" building
	A.2	80	39.7		
	A.3	80	39.7		
Existing Site	Add-Reno	80	80.0	No	No - manual-wet standpipe
Foley Site	B.1	93	60.1	No	No - manual-wet standpipe

Magnet School.	C.2	60	33.2	Likely	No - manual-wet standpipe

All of the base-repair / renovation-addition / new construction options considered in the preliminary evaluation of alternatives would require a new, NFPA 13 sprinkler system, with sprinkler coverage “through-out”.

In addition, all but the base-repair option would require stairwell standpipes.

5 new construction and 1 addition-renovation options are considered in this report. Key fire protection characteristics are summarized in Table 2 below.

TABLE 2

Location	New Construction Option	FP Gross Area Sq. Ft.	No. of Standpipes / Hose Valves	No. of Roof Hydrants	Fire Pump Required ?
Existing Site	A.1	418,610	7 / 29	7	Yes, Due to "high-rise" building
	A.2	416,786	5 / 20	5	
	A.3	426,172	4 / 15	4	
Existing Site	Base-Repair	169,000	None	None	No
Existing Site	Add-Reno	378,000	3 / 14 est	3	No - manual-wet standpipe
Foley Site	B.1	397,078	7 / 28	7	No - manual-wet standpipe
Magnet School.	C.2	418,564	4 / 12	4	Likely

Based on this study, the following work is recommended.

- Provide a new, NFPA 13 system through-out.
- Provide stairwell stand-pipes where the top floor level is 30 ft. or more above adjacent grade. *This applies to all options except base-repair.*

- Confirm with the Worcester Fire Dept. (WFD) if they would accept a manual-wet-fire-dept.-connection to serve the standpipe system. This was accepted for South High School – so we expect the same approval for this school – ***except for existing site, new-construction options, which are all "high-rise" – manual-wet standpipe not permitted by code.***

- Provide a new, ***schematic-design*** phase flow test at the city-selected preferred site.

- Keep all storage heights less than 12', and keep storage confined to designated storage rooms, with appropriate FP coverage.

- Connect new FP system alarms to a new central Fire Alarm Control Panel (FACP).

- Provide new Kitchen Exhaust Hood and Hood FP system under Kitchen Equipment

- With the addition of a fire sprinkler system "though-out" the building, many of the existing portable fire extinguishers will no longer be required. These should be removed, to minimize maintenance costs.

Maintenance:

- Train in-house personnel, and provide required, regular, sprinkler system and fire extinguisher inspections using in-house inspectors

- Provide additional required maintenance and testing of FP and fire extinguisher systems, alarms and flow via maintenance contract.

BUILDING DESCRIPTION

General: The existing Doherty High School (DoHS) was constructed in the mid 1960s, and has 2, long narrow wings parallel to Highland St. Because the site is on a hill, the 2nd floor of the front wing is level with the 1st floor of the rear wing.

For additional comments on the existing layout, hazards, school flammability standards, and storage issues, see the Existing Conditions – Preliminary Design Program report, dated 6-25-19

CONSTRUCTION OPTIONS:

3.3.3 D 1. d.
Doherty High School - Worcester, Ma.
Fire Protection - Final Evaluation of Alternatives
12-11-19

Based on the preliminary design program (PDP) submission, the City and MSBA have concurred that the following options should be evaluated in more detail. These are:

1. Base Repair of the existing high school

2. Complete Renovation of the existing high school with a large addition

3. A.1 – New construction on existing site - “Pods on Park”

4. A.2 – New construction on existing site - “Olmstead Homage”

5. A.3 - New construction on existing site - “Highland Proud”

6. B.1 – New construction at the Foley Stadium site.

7. C.2 - New construction at the Chandler Magnet School site.

FIRE PROTECTION RECOMMENDATIONS AND COST ISSUES

Base Repair

1. *New FP:* Provide a new, NFPA 13, wet, fire protection system thru-out the building.

2. *Standpipes:* Not Required, except for 2 stage hose-stations.

3. *Fire Dept. Connection:* We understand the Worcester Fire Department has recently become compatible with both 4” Storz and 2-1/2” Siamese” FDCs. We will re-review with WFD, which type to install for this project. 2 FDCs will be required if the addition is ***not high-rise***. 3 FDCs would be required for any high-rise options.

4. *Fire Pump:* Not Required

5. *Phasing:* As the building will be occupied during the construction period, work will have to be done in phases. Phasing will increase FP contractor costs as follow:

   . mobilizing and de-mobilizing for each phase,
   . testing new piping by phase,
   . purchasing materials by phase,
   . obtaining inspections by phase,
   . addressing punch items by phase.
   draining down existing piping to connect new piping, and re-filling.

Full Renovation with Additions to the Building

This level of work would require that all current FP code requirements be met by the existing building as well as any addition. Fire Protection work includes:

1. *New FP:* Provide a new, NFPA 13, wet, fire protection system thru-out the original building and new addition.

2. *Standpipes:* The top floor level of the proposed addition will be more than 30 ft above the lowest fire department access. Thus, stairwell standpipes will be required through-out the new addition. The existing 2-story building would not require standpipes. Each stairwell (having a standpipe) that does ***not*** extend to the roof will also require a roof hydrant at the top of it's standpipe.

   Standpipes require a much higher water-pressure and flow than a sprinkler system. NFPA 14 (which governs the installation of standpipes) specifically states it it ***not*** their intent to require fire pumps for standpipes if the city pressure is sufficient for the sprinkler systems. Thus, NFPA 14 permits the use of a manual-wet Fire Department Connection (i.e. fire dept. pumper will provide the required pressures) for feeding the standpipes. NFPA 14 requires (in a fully sprinkled building) that 1000 gpm stand-pipe water flow rate be calculated, with 100 psi outlet pressure at the most remote hose.

   The proposed stage is over 1,000 square feet, so will have 2 stage hose-stations.

3. *Fire Dept. Connection:* We understand the Worcester Fire Department has recently become compatible with both 4" Storz and 2-1/2" Siamese" FDCs. We will re-review with WFD, which type to install for this project. 2 FDCs are required for this ***non-***high-rise-building option.

4. *Fire Pump:* The most recent flow test available near this site is from 2007, however it showed good pressure and very good flow: 80 psi static, 75 psi residual, with 1,690 gpm flowing.

   This flow and pressure are adequate for the sprinkler system, but not for standpipes.

   A manual-wet-FDC could provide sufficient pressure for the standpipes, and this is the expected design for this option. Thus no fire-pump would be required.

5. *Phasing:* As the building will be occupied during the construction period, work will have to be done in phases. Phasing will increase FP contractor costs as follow:

   . mobilizing and de-mobilizing for each phase,
   . testing new piping by phase,
   . purchasing materials by phase,

. obtaining inspections by phase,
. addressing punch items by phase.
draining down existing piping to connect new piping, and re-filling.

New Construction – existing site

All new-construction options at the existing site (A.1 to A.3) will be "high-rise" buildings. High-rise buildings have additional fire-protection requirements as follows:

- Standpipes must have an automatic water supply – this means a fire pump for these 3 options.

- A secondary water supply is required in seismic catergories C, D, E, and F. This site is seismic catergory B, so this does ***not apply.***

- 2-hour rated fire-pump room, and 2-hour rated access to same.

- A fully automatic back-up fire pump system is required if any portion of the high-rise standpipes cannot be served by the fire dept. pumper. This will have to be calculated for the preferred option.

All new Educational use buildings over 12,000 sqft must meet all current FP code requirements, including a new NFPA 13 fire protection system through-out the building. Fire Protection work for this option includes:

1. *New FP:* Provide a new, NFPA 13, wet, fire protection system thru-out the new school building. All 3 options also include an underground parking garage (under the building for A.1 and A.2 and under the adjoining fields for A.3). A "dry system" with dedicated piping, air-compressors, and risers will be required:

   A. for Options A.1 and A.2 if the parking garage exceeds 5,000 sqft.

   B. For Option A.3 if the parking garage exceeds 12,000 sqft.

2. *Standpipes:* The highest floor level for all A-options is well over 30 ft. above the lowest fire dept. access, thus stairwell standpipes are required in all 3 A options. Also for all A options, an interior hose station will be required on each floor level as the building is built. See table 2 for a summary count of standpipes, hose stations, and roof-hydrants.

   The stage planned is over 1,000 square feet, so 2 stage hose-stations ***will*** be required.

3. *Fire Dept. Connection:* We understand the Worcester Fire Department has recently become compatible with both 4" Storz and 2-1/2" Siamese" FDCs. We will re-

review with WFD, which type to install for this project. 3 FDCs are required for all A-options, which are all high-rise buildings.

4. *Fire Pump:* The most recent flow test available near this site is from 2007, however it showed good pressure and very good flow: 80 psi static, 75 psi residual, with 1,690 gpm flowing.

   This flow and pressure are adequate for the sprinkler system, but not for standpipes.

   As a manual-wet-FDCs is not permitted in high-rise buildings, these 3 options will all require a fire-pump.

5. *Phasing:* As the newly constructed building will be completed and occupied prior to any work in the existing building, there will be no additional FP costs for "phasing".

New Construction – Foley Stadium Site

All new Educational use buildings over 12,000 sqft must meet all current FP code requirements, including a new NFPA 13 fire protection system through-out the building. Fire Protection work for this option includes:

1. *New FP:* Provide a new, NFPA 13 fire protection system thru-out the new construction.

2. *Standpipes:* The highest floor level is well over 30 ft. above the lowest fire dept. access, thus stairwell standpipes will be required. Also, interior hose station will be required on each floor level as the building is built. See table 2 for a summary count of standpipes, hose stations, roof-hydrants, etc.

   The stage planned is over 1,000 square feet, so 2 stage hose-stations ***will*** be required.

3. *Fire Dept. Connection:* We understand the Worcester Fire Department has recently become compatible with both 4" Storz and 2-1/2" Siamese" FDCs. We will re-review with WFD, which type to install for this project. 2 FDCs will be required for this ***non***-high-rise-building site.

4. *Fire Pump:* The most recent flow test available near this site is from 2015, however it showed very good pressure and flow: 93 psi static, 89 psi residual, with 1,500 gpm flowing.

   This flow and pressure are adequate for the sprinkler system, but not for standpipes. A manual-wet-FDC could provide sufficient pressure for the standpipes, and this is the expected design for this ***non***-high-rise-building site.

5. *Phasing:* As the newly constructed building will be completed and occupied prior to any work in the existing building, there will be no additional FP costs for "phasing".

New Construction – Chandler Magnet School Site

All new Educational use buildings over 12,000 sqft must meet all current FP code requirements, including a new NFPA 13 fire protection system through-out the building. Fire Protection work for this option includes:

4. *New FP:* Provide a new, NFPA 13 fire protection system thru-out the new construction.

5. *Standpipes:* The highest floor level is well over 30 ft. above the lowest fire dept. access, thus stairwell standpipes will be required. Also, interior hose station will be required on each floor level as the building is built. See table 2 for a summary count of standpipes, hose stations, roof-hydrants, etc.

   The stage planned is over 1,000 square feet, so 2 stage hose-stations ***will*** be required.

6. *Fire Dept. Connection:* We understand the Worcester Fire Department has recently become compatible with both 4" Storz and 2-1/2" Siamese" FDCs. We will re-review with WFD, which type to install for this project. 2 FDCs will be required for this ***non-***high-rise-building site.

4. *Fire Pump:* The most recent flow test available near this site is from 2001. It showed moderate pressure and very good flow: 60 psi static, 55 psi residual, with 1,500 gpm flowing.

   This flow and pressure may or may not be adequate for the sprinkler system. This site is the most likely to require a fire pump for the sprinkler system.

   A manual-wet-FDC could provide sufficient pressure for the standpipes, and this is the expected design for this ***non*** "high-rise-building" site.

5. *Phasing:* As the newly constructed building will be completed and occupied prior to any work in the existing building, there will be no additional FP costs for "phasing".

GENERAL RECOMMENDATIONS IMPACTING FP COSTS

The following general recommendations apply to all renovation and new construction options being considered:

Storage:

The following storage recommendations apply to ***all options*** being considered:

- base-repair renovation,
- renovation-addition,
- new-construction-existing site

With attentive planning and design, the “hazard level” of storage can be minimized, to reduce FP cost and complexity.

1. **Miscellaneous Storage** has separate, and generally less stringent requirements for FP protection than regular storage. Thus, it is advantageous to adjust storage room design to ensure anything stored within would be considered “miscellaneous storage”. NFPA requirements for “miscellaneous storage” are in plain text below, comments re school design are in **bold.**

    a. Storage must be incidental to the building’s main use. **All storage rooms in E-use buildings qualify.**

    b. Height from the floor to the top of storage must not exceed 12’. **This can be best assured if the ceiling height is less than 12’.**

    c. Storage areas cannot exceed 10% of the total building area, or 4,000 sqft, whichever is less. **Make total sqft of storage rooms less than 4,000 sqft, and less than 10% of building’s area..**

    d. Each individual storage area / pile cannot exceed 1000 sqft. **Make all storage rooms under 1,000 sqft.**

    e. If there are several “piles” of storage in a large open room, each 1,000 sqft pile must be 25’ or more from the next pile. **In storage rooms over 1,000 sqft do not use any “caged” sub-rooms. Provide walls for any sub-rooms.**

2. **Miscellaneous Storage Hazard Levels:** The sizing of FP pipe is based on how large an area of sprinklers is assumed would activate in a fire, and how many gallons-per-minute (gpm) of water flow is required per sqft of operating area.

    As the “hazard level” increases, both the design operating area, and the required gpm/sqft also increase. Thus “extra-hazard” (EH1 and EH2) areas have a much, much higher total water flow (minimum 1250 to 1500) than “ordinary hazard” (OH1 or OH2) areas (minimum 475 to 550 gpm). This results in larger FP piping including the riser, backflow, and underground service.

EH areas also require a larger number of (more closely spaced) sprinklers to be installed, further increasing costs. The recommendations a thru d in **bold** below would keep the storage areas "ordinary hazard".

a. Schools very often store materials in large plastic bins, which are virtually always Group A plastics. Group A plastics are the highest hazard of all "solid" materials typically found in a school. If a plastic bin contains ordinary hazards such as paper, wood, clothing, etc, (so the "bin" is less than 25% of the total volume), the "package" is considered an ordinary hazard. .**Use plastic bins primarily for storing ordinary hazard materials such as metals, paper, cardboard, foods, wood, leather, natural fibers, etc.**

b. Wherever possible, use sturdy cardboard cartons to store Group A plastic materials, and keep the top of plastic storage under 10' AFF.

c. If plastic materials must be stored "exposed" or in plastic bins, keep the top of storage under 5' AFF thru-out the entire plastic-storage area.

d. Storage that contains more than 25% (by volume) Group A plastics should be stored in a separate EH storage room (see adjacent hazards below)

3. **Flammable Liquids Storage Issues:** Provide listed flammable storage cabinets for the storage of all flammable or combustible liquids or chemicals.

4. **Adjacent hazards**: Sometimes there is a small area of high hazard storage located within a room that is mostly a lower hazard. An example is a "wire-cage" for off-season sports equipment, located within a receiving room. A fairly large percentage of sports equipment these days is made of plastic – most frequently Group A plastics.

If the higher hazard is not separated from the surrounding, lower hazard area by a solid wall and ceiling, then the higher hazard determines the design area and gpm/sqft for both the high hazard area plus a 15'-on-all-sides buffer area.

If the small high-hazard area is separated by a solid wall and ceiling, the design operating area is determined by the larger, surrounding (lower-hazard) room, and there is no 15' extension of the higher hazard gpm/sqft.

Where an area containing more-than-25%-by-volume-plastic storage occurs within a larger room containing paper, wood, foods, natural fibers, or metal

stored materials, provide a solid wall and ceiling around the plastic storage area.

5. **How Materials are Stored:** FP requirements vary depending on how materials are store: Different methods are listed below, from ***less*** hazardous, to ***more*** hazardous.

    a. Solid piled, palletized, bin-box, and shelf storage are lower hazard ways of storing.

        i. Solid piled means materials stacked on top of each other, directly on the floor.

        ii. Palletized means materials stored on top of pallets, often in solid-piled stacks.

        iii. Bin-box means materials stored in 5-sided wood, metal, or cardboard boxes, with the open side facing the aisle, and little or no horizontal or vertical space around individual boxes.

        iv. Shelf storage means stored on shelves 30" or less in depth, with minimum 30" aisles between shelves.

        v. **Store materials in solid piles, or on shelving less than 30" deep wherever possible. Metal shelves preferred. Wood acceptable. NO plastic shelving.**

    b. For all ***exposed (uncartoned)*** plastic materials, and for ordinary materials ***over 10' high,*** Back-to-back shelving and rack-storage are higher hazard ways of storing.

        i. **Try to avoid back-to-back shelving and rack storage where-ever top of storage is over 10' high, and avoid it for any exposed-plastic storage. To avoid them, use solid piled storage, or shelf storage under 30" deep (aisle to aisle).**

6. **Ceiling Height:** NFPA allows a ceiling height modifier to the basic design area, if quick response sprinklers are used. It only applies to light and ordinary hazard spaces, under 20' high, wet systems, with no unprotected ceiling pockets.

    a. If ceiling height is less than 10' for an "ordinary hazard (OH)" storage room, the design area can be reduced by 40%. This reduces total design flow by 40%, allowing smaller pipe to be used. **In an OH storage situation, a ceiling height 10' or under is very helpful.**

    b. As the ceiling height increases up to 20’, the design area reduction decreases in proportion, down to a low of 25%. **Still helpful, though with any ceiling over 12’, we would be at greater risk of losing “miscellaneous storage” status.**

7. NFPA has a ceiling slope modifier to the basic design area:

    a. For ceiling slopes over 2:12, the design area must be ***increased*** by 30%. **Use only flat ceilings in storage areas.**

- **General Storage issues:** Plan for all storage heights to be less than 12’. Review available storage areas and storage needs. Organize storage to keep it confined to designated storage rooms, with appropriate FP coverage.

- **Special Storage Issues:** Provide listed flammable storage cabinets for the storage of all flammable or combustible liquids or chemicals. Do not permit any plastic shelving. Metal shelving has the best fire resistance, wood shelving is acceptable.

- **Flammability Standards:** Ensure that all (existing and) new furniture and window coverings meet 527 CMR flammability standards.

- **Fire Signaling:** Connect all new FP system alarms to a new central Fire Alarm Control Panel (FACP - provided under electrical).

Maintenance:

- **Training and inspections:** Train in-house personnel, and provide required monthly inspections using in-house inspectors

- **FP Maintenance Contract:** Provide additional code-required maintenance and testing of FP systems alarms and flow via maintenance contract.

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Date: November 13, 2019

To: Rob Para, AIA

Co: Lamoureux-Pagano Assoc. Architects, Inc. (via email)

From: Kevin Seaman. P.E. LEED® AP

Re: Doherty High School: **Feasibility Study HVAC & Plumbing Narrative – No Build Option**

The following narrative describes the proposed scope of work pertaining to the heating, ventilation and air conditioning (HVAC) systems and the plumbing systems at the Doherty High School for the No Build Option. As noted in our earlier existing Mechanical conditions report, the systems in within the existing building vary in their age however, much of the hydronic heating and plumbing distribution systems are original and have exceeded their useful expected service life and as such we have proposed a replacement of a majority of the systems as described herein. In addition, many of the existing HVAC terminals, although not past their useful life, have no ability to cool the air and have poor acoustical performance to support a classroom environment making them undesirable for reuse within the existing building.

HVAC

Central Heating Plant:

1. The buildings heating boilers shall be replaced with high efficiency (93%+) gas-fired condensing hot water boilers. Pending final load calculations and system design, initially the boiler plant shall consist of three (3) gas-fired condensing fire-tube style boilers each with a gross input capacity of 7,500,000 BTUH similar to Lochinvar Crest or equal by Aerco or Viessman. Boilers shall be located within an existing lower level boiler room. Combustion air and flue venting for the new boilers shall run up the building to the roof level.

2. All heating piping shall be replaced with a 2-pipe hydronic hot water system complete with two (2) sets of tri-plex vertical in-line system pumps as manufactured by Armstrong, Grundfos or equal rated for the system flow for their respective building segments. Hydronic system shall connect to 2-pipe fan coil units, VAV terminals, unit heaters, hot water coils and fin-tube radiation located throughout the building. All terminals shall be designed to operate with a maximum water temperature of 140°F to maximize plant capacity. Pumps shall have premium efficient motors and be fitted with integral variable speed drives so that pump energy matches system flow demand.

3. Intermediate mechanical closets shall be provided on the upper level of the building and shall contain plate-frame heat exchangers and high efficiency pumps with variable speed ECM motors. These heat exchangers shall establish a water to glycol loop interface whereas all

packaged rooftop equipment shall be fed with a glycol water mix for improved freeze protection.

4. Phasing Comments:

    - We suggest the boiler plant be located within whichever area is considered the phase 1 area of renovation. In this way the boiler plant can be built and expanded (as applicable) using modular boilers to accept and support the future construction phases.

    - We recommend any temporary modular classroom structure be fitted with packaged HVAC electric heat pumps which do not rely on the main building boiler plant. Since the existing building has and will continue to undergo replacement of exiting unit ventilators with radiation as sections are renovated.

Central Cooling Plant:

Although the proposed presumes the use of packaged, refrigerant based, direct expansion (DX) cooling and dehumidification systems the design team shall review the possibility of using a central chilled water plant tied to chilled water coils in rooftop air handlers in lieu of DX coils and compressors in the rooftop equipment. Review during the design shall be done in conjunction with the energy modeler and the utility company to ascertain the various advantages and disadvantages of using such a system. Potential for use of a chilled beam system throughout the classroom areas may also be considered due to the existing tight floor to floor conditions and for improved energy performance.

Distribution and Ventilation:

1. Most of the buildings classroom areas are heated thru the use of fan coils or classroom unit ventilators with outdoor air louvers sealed off. Outdoor air for many classrooms is provided through the use of several roof mounted total energy recovery units. Although these units are currently within their projected useful service life they offer no ability to cool or dehumidify and as such are not desirable for reuse in a fully air conditioned structure.

    We propose new packaged rooftop units be provided which shall have total energy recovery wheels to utilize waste exhaust to temper incoming fresh air, hot water coils, DX coils (see note below) & hot gas reheat coils for cooling and dehumidification control. Units shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery volumes based on space temperature and air quality demand as determined by CO2 sensors. The units shall be as manufactured by Aaon, Daiken, Valent or equal. Note: The possibility of using a central chilled water plant in lieu of DX coils in the rooftop equipment shall be considered early on during the design and in conjunction with the energy modeler and the utility company.

    The possibility of using a central chilled water plant in lieu of DX coils in the rooftop equipment shall be considered early on during the design and in conjunction with the energy modeler and the utility company. With the chiller option the potential for use of a chilled beam system throughout the classroom areas shall also be considered due to the existing tight floor to floor conditions and for improved energy performance.

2. The existing duct distribution system serving most classrooms is not adequately sized to support air conditioning. As such we recommend much of the ductwork be removed and replaced with new ductwork supporting VAV terminals. Any existing ducts reused shall be internally cleaned, sealed and insulated.
3. If an all air system is selected (i.e. not chilled beam), most all classrooms shall be provided with ventilation and air conditioning through the use of displacement diffusers located low along the walls. This type of ventilation system improves indoor air quality, environmental conditions and energy efficiency in several ways some of which are:
    - Introduces fresh air down within the breathing zone (below 6 feet).
    - Reduces the amount of fresh air required to ventilate the space.
    - Limits the mixing of air contaminants within the space.
    - System noise is reduced with diffuser air velocities a fraction of that of most conventional mixed air systems.
    - Increases periods of economizer cooling (free cooling with outside air) by using higher supply air temperatures than most conventional mixed air systems.
    - Increases cooling equipment efficiency by having higher return air and supply air temperatures than most conventional mixed air systems.
4. Science lab units shall be configured for 100% OA with exhaust adjusting to maintain space under slight negative pressure with respect to school as well as to match any fume hood exhaust. The units shall be as manufactured by Valent, Aaon, Daikin or equal.
5. Throughout the building exterior perimeter areas provide fin-tube radiation to support a majority of the space heating load. VAV and/or fan powered VAV units shall be used in all interior area or where fin-tube radiation is not possible or practical.

6. The computer classrooms as well as the MDF room shall be cooled via high efficiency ductless split units (one per room) with fan coil mounted within ceiling and condensing unit on roof.

7. Automotive shop area, if applicable, shall include a dedicated packaged rooftop system. The unit shall have total energy recovery wheels, hot water coils, DX coils & hot gas reheat coils for cooling and dehumidification control. Unit shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery volumes based on space temperature and air quality demand as determined by CO and NOx sensors. The unit shall be as manufactured by Valent, Aaon, Daikin or equal.
8. High plume style fume hood exhaust fan(s) shall be provided and connected to science lab fume hoods. Fan shall vary flow based on variable flow hood demand. Each hood shall be

fitted with sash airflow monitor and branch duct damper control as manufactured by TSI or Phoenix Controls to maintain flow at each hood based on open sash air velocity.

9. Provide kitchen hood system with energy saving smoke/heat detection systems coupled to variable speed exhaust fan. Provide new gas-fired make-up air system for the kitchen which shall have the ability to reset make-up air system volume in unison with kitchen hood exhaust demand control system. Outdoor make-up air shall be tempered heating only introduced directly in front of the kitchen hoods to minimize the need for cooling the air and impact on the room environment.
10. Locker rooms shall be provided with packaged rooftop units and supply and exhaust ductwork. The units shall have total energy recovery wheels and hot water coils and shall be configured for 100% OA ventilation during occupied periods. Units shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery based on space temperature and air quality demand as determined by humidity and CO_2 sensors. The units shall be as manufactured by McQuay, Trane, Aaon or equal.
11. Restrooms (other than those in the locker room), Janitors closets, etc… shall be exhaust via roof mounted exhaust fans controlled by occupancy sensors located in the respective areas served.
12. Phasing Comments:
    - Most areas of the existing building shall be supported by roof mounted HVAC units serving multiple floors and as such the renovation approach should consider segmenting the building work into multi-story blocks.
    - We recommend any temporary modular classroom structures be fitted with packaged HVAC electric heat pumps which do not rely on the main building boiler plant.

Controls:

1. The current school already incorporates a direct digital control (DDC) energy management system (EMS) as supplied and service by Automated Building Systems, Inc. This system shall be extended to include all new systems and incorporate further energy saving and monitoring features. The system monitors and controls the HVAC equipment for efficient use and for proper indoor air quality and temperatures. The system is designed on PC based architecture and adjustments are made on a graphics based presentation of building systems. The system also supports maintenance and record keeping needs of the facility. Occupancy of the school is based on the standard school year with occupied/unoccupied conditions based on current school day practice. This is an adjustable feature that can be made to reflect additional operating needs and use of the school building by staff or others.

2. The HVAC systems are generally operated on a school day basis coinciding with the occupied/unoccupied schedule of the standard 180-day school year. Adjustments can be

made through the DDC system to allow for usage during periods other than the usual school operating periods.

3. Space temperature is monitored by individual space sensors that transmit data to the central monitoring and control station. Space conditions are adjustable through DDC system and can be modified to meet individual needs. Local control of space conditions is limited to predefined adjustments in space temperature and to facilitate a 3-hour occupied override feature.

4. All classroom systems shall incorporate space occupancy sensors to reset ventilation levels when room is unoccupied during a regularly scheduled occupied period. Systems serving high occupancy areas such as the cafeteria and gymnasium also include carbon dioxide (CO_2) indoor air quality (IAQ) sensors which optimize the fresh outdoor air ventilation levels in response to variations in space occupancies.

5. The system shall incorporate many energy-saving features such as 1) hot water temperature reset controls, 2) static pressure reset controls, 3) occupancy based controls and 4) ventilation reset controls to name just a few.

6. The building shall be connected to emergency power source for operation of heating boilers and pumps during loss of primary power. Systems on emergency power may include MDF and IDF rooms as well as areas deemed critical by the Owner.

7. Phasing Comments:

   - The existing building control system can be easily expanded to support the building in renovation segments through the use of networked unitary controls. We do not suggest the modular classrooms be connected to this system due to their temporary nature.

Sustainable Opportunities:

Many of the proposed system and control sequences noted above minimize energy consumption however, further optimization may be obtained by investigating the use of either high efficiency air cooled water chillers of water cooled cooling equipment which has an inherent better energy performance than air cooled equipment. A life cycle evaluation must be performed as size and length of cooling system run time will impact overall value.

In addition to the water cooled cooling option, consideration could also be given to a geothermal based option. A geothermal chiller/heater could support building cooling loads in the summer as well as provide supplemental heating to the building by preheating both the heating water and domestic hot water thereby reducing the demand on the building fossil fuel boilers. A geothermal well field analysis as well as a life cycle cost would need to be performed to verify economic viability.

Two solar based options to consider would be passive solar wall design using air passing through a wall assembly facing South to preheat air and/or vacuum tube thermal solar panels mounted on the roof to directly supplement the building heating and domestic hot water systems.

Plumbing

Distribution & Conveying Systems

The water distribution system is more than 40 years of age and most likely has some lead containing piping, fittings and/or solder as well as thinning pipe walls. As such, we suggest the entire domestic water distribution system be replaced in its entirety. The new distribution system would consist of copper piping with lead-free fittings and products.

All sanitary sewer and rain water conductors located above the grade floor slab shall be replaced in their entirety unless examined and found to be in good condition. Underground waste piping shall be examined via camera inspection and if found to be in good condition shall be retained and reused. All sanitary sewer and rain water conductors shall be constructed of cast iron. An acid waste system consisting of acid rated piping and a neutralizing system shall be provided for the science labs.

All waste from the kitchen(s) shall be piped to a large (1,500 gallon+/-) exterior grease trap prior to discharge to the municipal sewer system.

Any modular classroom buildings should be equipped with adequate student and staff restrooms to support the population of the modular. These restrooms should be fed with potable cold water from the existing building. Sanitary sewer lines should tie into site sanitary sewer mains. All water and sanitary drain lines located outside the heated envelope shall be heat traced and insulated where located above grade or less than 4 feet below grade.

Domestic Hot Water

High efficiency (93%+) gas-fired condensing boiler/water heaters and tanks shall be used to replace the existing water heaters and support the buildings domestic hot water needs. In addition, this system shall be coupled to the heat output of thermal solar panels, if selected. The use of these supplemental systems will be dependent on their life cycle cost and require further study.

Dual water tempering valve stations shall be provided at the water heater to maintain water heater temperatures above 140°F to prevent bacterial growth in the tank while delivering 125°F water to service fixtures for sanitation and 110°F hot water to public lavatory sinks and other student and public use fixtures to prevent scalding.

For the temporary modular structures, provide local electric tank type water heaters to support the restroom lavatory and Janitor sink fixtures.

Fixtures

Planned renovations will most likely require removal of the existing fixtures. Once removed the fixtures should be replaced with code compliant water conserving fixtures. In addition, to achieve improved LEED® compliance and further water savings we recommend ultra-low flush water closets and urinals be utilized. The ultra low flush water closets use 1.28 gallons per flush as opposed to the 1.6 gallon per flush allowed by today's code and the urinals use 1 pint (0.13 gallons) per flush as opposed to the current 1 gallon per flush allowed. The combination of these two can result in substantial savings overtime. However, these fixtures should only be used when connecting to new well pitched (more than code minimum) sewer lines as the low flow fixtures do have a tendency to result in line blockages if the sewer line pitch or conditions is not good.

Lavatory faucets shall be of the low flow metered type controlled by either a wired or battery powered sensor operated faucet. Use of these faucets promotes good hygiene as well as water conservation.

Natural Gas Service:

The existing gas service to the building currently supports the heating boilers, domestic water heaters and many of the rooftop units. The projected new load, gas-fired heating boilers, water heaters and cooking equipment is expected to be near the same as the current load and may be less due to proposed building thermal improvements as well as more efficient heating and hot water boilers.

Sustainable Opportunities:

Many of the proposed fixtures and control sequences noted above minimize water usage and conserve energy however, further optimization may be obtained by investigating the use of storm water recovery systems. These systems collect, filter and utilize storm water to supply water to water closets and urinals throughout the building. A life cycle evaluation must be performed to ascertain the initial first costs, annual operating costs and projected savings associated with such a system.

Use of vacuum tube thermal solar panels shall be further considered, if desired, as part of a life cycle study analysis.

End of HVAC & Plumbing Narrative

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Date: November 13, 2019

To: Rob Para, AIA

Co: Lamoureux-Pagano Assoc. Architects, Inc. (via email)

From: Kevin Seaman. P.E. LEED® AP

Re: Doherty High School: **Feasibility Study HVAC & Plumbing Narrative – Addition & Renovation Option**

The following narrative describes the proposed scope of work pertaining to the heating, ventilation and air conditioning (HVAC) systems and the plumbing systems at the Doherty High School for the Addition & Renovation Option. As noted in our earlier existing Mechanical conditions report, the systems in within the existing building vary in their age however, much of the hydronic heating and plumbing distribution systems are original and have exceeded their useful expected service life and as such we have proposed a replacement of a majority of the systems as described herein. In addition, many of the existing HVAC terminals, although not past their useful life, have no ability to cool the air and have poor acoustical performance to support a classroom environment making them undesirable for reuse within the existing building.

HVAC

Central Heating Plant:

1. The buildings heating boilers shall be replaced with high efficiency (93%+) gas-fired condensing hot water boilers. Pending final load calculations and system design, initially the boiler plant shall consist of four (4) gas-fired condensing fire-tube style boilers each with a gross input capacity of 12,000,000 BTUH similar to Lochinvar Crest or equal by Aerco or Viessman. Boilers shall be located within an existing lower level boiler room. Combustion air and flue venting for the new boilers shall run up the building to the roof level.

2. All heating piping shall be replaced with a 2-pipe hydronic hot water system complete with two (2) sets of tri-plex vertical in-line system pumps as manufactured by Armstrong, Grundfos or equal rated for the system flow for their respective building segments. Hydronic system shall connect to 2-pipe fan coil units, VAV terminals, unit heaters, hot water coils and fin-tube radiation located throughout the building. All terminals shall be designed to operate with a maximum water temperature of 140°F to maximize plant capacity. Pumps shall have premium efficient motors and be fitted with integral variable speed drives so that pump energy matches system flow demand.

3. Intermediate mechanical closets shall be provided on the upper level of the building and shall contain plate-frame heat exchangers and high efficiency pumps with variable speed ECM motors. These heat exchangers shall establish a water to glycol loop interface whereas all

packaged rooftop equipment shall be fed with a glycol water mix for improved freeze protection.

4. Phasing Comments:

   - We suggest the boiler plant be located within whichever area is considered the phase 1 area of Addition. In this way the boiler plant can be built and expanded (as applicable) using modular boilers to accept and support the future construction phases.

   - We recommend any temporary modular classroom structure be fitted with packaged HVAC electric heat pumps which do not rely on the main building boiler plant. Since the existing building has and will continue to undergo replacement of exiting unit ventilators with radiation as sections are renovated.

Central Cooling Plant:

Although the proposed presumes the use of packaged, refrigerant based, direct expansion (DX) cooling and dehumidification systems the design team shall review the possibility of using a central chilled water plant tied to chilled water coils in rooftop air handlers in lieu of DX coils and compressors in the rooftop equipment. Review during the design shall be done in conjunction with the energy modeler and the utility company to ascertain the various advantages and disadvantages of using such a system. Potential for use of a chilled beam system throughout the classroom areas may also be considered due to the existing tight floor to floor conditions and for improved energy performance.

Distribution and Ventilation:

1. Most of the buildings existing classroom areas are heated thru the use of fan coils or classroom unit ventilators with outdoor air louvers sealed off. Outdoor air for man classrooms is provided through the use of several roof mounted total energy recovery units. Although these units are currently within their projected useful service life they offer no ability to cool or dehumidify and as such are not desirable for reuse in a fully air conditioned structure.

   We propose new packaged rooftop units be provided which shall have total energy recovery wheels to utilize waste exhaust to temper incoming fresh air, hot water coils, DX coils (see note below) & hot gas reheat coils for cooling and dehumidification control. Units shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery volumes based on space temperature and air quality demand as determined by CO2 sensors. The units shall be as manufactured by Aaon, Daiken, Valent or equal. Note:

   The possibility of using a central chilled water plant in lieu of DX coils in the rooftop equipment shall be considered early on during the design and in conjunction with the energy modeler and the utility company. With the chiller option the potential for use of a chilled beam system throughout the classroom areas shall also be considered due to the tight floor to floor conditions and for improved energy performance.

2. The existing duct distribution system serving most existing classrooms is not adequately sized to support air conditioning. As such we recommend much of the ductwork be removed and replaced with new ductwork supporting VAV terminals. Any existing ducts reused shall be internally cleaned, sealed and insulated.
3. Most all classrooms shall be provided with ventilation and air conditioning through the use of displacement diffusers located low along the walls. This type of ventilation system improves indoor air quality, environmental conditions and energy efficiency in several ways some of which are:
    - Introduces fresh air down within the breathing zone (below 6 feet).
    - Reduces the amount of fresh air required to ventilate the space.
    - Limits the mixing of air contaminants within the space.
    - System noise is reduced with diffuser air velocities a fraction of that of most conventional mixed air systems.
    - Increases periods of economizer cooling (free cooling with outside air) by using higher supply air temperatures than most conventional mixed air systems.
    - Increases cooling equipment efficiency by having higher return air and supply air temperatures than most conventional mixed air systems.
4. Science lab units shall be configured for 100% OA with exhaust adjusting to maintain space under slight negative pressure with respect to school as well as to match any fume hood exhaust. The units shall be as manufactured by Valent, Aaon, Daikin or equal.
5. Throughout the building exterior perimeter areas provide fin-tube radiation to support a majority of the space heating load. VAV and/or fan powered VAV units shall be used in all interior area or where fin-tube radiation is not possible or practical.
6. The computer classrooms as well as the MDF room shall be cooled via high efficiency ductless split units (one per room) with fan coil mounted within ceiling and condensing unit on roof.
7. Automotive shop area, if applicable, shall include a dedicated packaged rooftop system. The unit shall have total energy recovery wheels, hot water coils, DX coils & hot gas reheat coils for cooling and dehumidification control. Unit shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery volumes based on space temperature and air quality demand as determined by CO and NOx sensors. The unit shall be as manufactured by Valent, Aaon, Daikin or equal.
8. High plume style fume hood exhaust fan(s) shall be provided and connected to science lab fume hoods. Fan shall vary flow based on variable flow hood demand. Each hood shall be fitted with sash airflow monitor and branch duct damper control as manufactured by TSI or Phoenix Controls to maintain flow at each hood based on open sash air velocity.
9. Provide kitchen hood system with energy saving smoke/heat detection systems coupled to variable speed exhaust fan. Provide new gas-fired make-up air system for the kitchen which

shall have the ability to reset make-up air system volume in unison with kitchen hood exhaust demand control system. Outdoor make-up air shall be tempered heating only introduced directly in front of the kitchen hoods to minimize the need for cooling the air and impact on the room environment.

10. In all options if atriums are employed that freely open to three or more floors, smoke evacuation systems shall be employed which reject smoke from the top of the atrium and introduce outside make-up air at the lowest levels. A 3rd party reviewer shall be employed to perform specialized CFD modeling to optimize system design as well as to perform code required peer review and testing.
11. Any building segment considered to be high rise shall incorporate stair tower pressurization in the egress stairs. In addition, in floors which do not have sufficient exterior windows for smoke evacuation the HVAC system shall be configured for use as a smoke evacuation system during clean-up by the fire department after a fire. This shall be not construed as a floor smoke control system.
12. Locker rooms shall be provided with packaged rooftop units and supply and exhaust ductwork. The units shall have total energy recovery wheels and hot water coils and shall be configured for 100% OA ventilation during occupied periods. Units shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery based on space temperature and air quality demand as determined by humidity and CO2 sensors. The units shall be as manufactured by McQuay, Trane, Aaon or equal.
13. Restrooms (other than those in the locker room), Janitors closets, etc… shall be exhaust via roof mounted exhaust fans controlled by occupancy sensors located in the respective areas served.
14. Phasing Comments:

    - Most areas of the existing building shall be supported by roof mounted HVAC units serving multiple floors and as such the renovation approach should consider segmenting the building work into multi-story blocks.

    - We recommend any temporary modular classroom structures, if used, be fitted with packaged HVAC electric heat pumps which do not rely on the main building boiler plant.

Controls:

1. The current school already incorporates a direct digital control (DDC) energy management system (EMS) as supplied and service by Automated Building Systems, Inc. This system shall be extended to include all new systems and incorporate further energy saving and monitoring features. The system monitors and controls the HVAC equipment for efficient use and for proper indoor air quality and temperatures. The system is designed on PC based architecture and adjustments are made on a graphics based presentation of building systems. The system also supports maintenance and record keeping needs of the facility. Occupancy

of the school is based on the standard school year with occupied/unoccupied conditions based on current school day practice. This is an adjustable feature that can be made to reflect additional operating needs and use of the school building by staff or others.

2. The HVAC systems are generally operated on a school day basis coinciding with the occupied/unoccupied schedule of the standard 180-day school year. Adjustments can be made through the DDC system to allow for usage during periods other than the usual school operating periods.

3. Space temperature is monitored by individual space sensors that transmit data to the central monitoring and control station. Space conditions are adjustable through DDC system and can be modified to meet individual needs. Local control of space conditions is limited to predefined adjustments in space temperature and to facilitate a 3-hour occupied override feature.

4. All classroom systems shall incorporate space occupancy sensors to reset ventilation levels when room is unoccupied during a regularly scheduled occupied period. Systems serving high occupancy areas such as the cafeteria and gymnasium also include carbon dioxide (CO2) indoor air quality (IAQ) sensors which optimize the fresh outdoor air ventilation levels in response to variations in space occupancies.

5. The system shall incorporate many energy-saving features such as 1) hot water temperature reset controls, 2) static pressure reset controls, 3) occupancy based controls and 4) ventilation reset controls to name just a few.

6. The building shall be connected to emergency power source for operation of heating boilers and pumps during loss of primary power. Systems on emergency power may include MDF and IDF rooms as well as areas deemed critical by the Owner.

7. Phasing Comments:

   - The existing building control system can be easily expanded to support the building additions and renovations in segment phases through the use of networked unitary controls. We do not suggest the modular classrooms, if used, be connected to this system due to their temporary nature.

Sustainable Opportunities:

Many of the proposed system and control sequences noted above minimize energy consumption however, further optimization may be obtained by investigating the use of either high efficiency air cooled water chillers of water cooled cooling equipment which has an inherent better energy performance than air cooled equipment. A life cycle evaluation must be performed as size and length of cooling system run time will impact overall value.

In addition to the water cooled cooling option, consideration could also be given to a geothermal based option. A geothermal chiller/heater could support building cooling loads in the summer as well as provide supplemental heating to the building by preheating both the heating water and domestic hot water thereby reducing the demand on the building fossil fuel boilers. A geothermal well field analysis as well as a life cycle cost would need to be performed to verify economic viability.

Two solar based options to consider would be passive solar wall design using air passing through a wall assembly facing South to preheat air and/or vacuum tube thermal solar panels mounted on the roof to directly supplement the building heating and domestic hot water systems.

Plumbing

Distribution & Conveying Systems

The water distribution system is more than 40 years of age and most likely has some lead containing piping, fittings and/or solder as well as thinning pipe walls. As such, we suggest the entire domestic water distribution system be replaced in its entirety. The new distribution system would consist of copper piping with lead-free fittings and products throughout both the renovation and addition.

All sanitary sewer and rain water conductors located above the grade floor slab shall be replaced in their entirety unless examined and found to be in good condition. Underground waste piping shall be examined via camera inspection and if found to be in good condition shall be retained and reused. All sanitary sewer and rain water conductors shall be constructed of cast iron. An acid waste system consisting of acid rated piping and a neutralizing system shall be provided for the science labs.

All waste from the kitchen(s) shall be piped to a large (1,500 gallon+/-) exterior grease trap prior to discharge to the municipal sewer system.

Any modular classroom buildings should be equipped with adequate student and staff restrooms to support the population of the modular. These restrooms should be fed with potable cold water from the existing building. Sanitary sewer lines should tie into site sanitary sewer mains. All water and sanitary drain lines located outside the heated envelope shall be heat traced and insulated where located above grade or less than 4 feet below grade.

Domestic Hot Water

High efficiency (93%+) gas-fired condensing boiler/water heaters and tanks shall be used to replace the existing water heaters and support the buildings domestic hot water needs. In addition, this system shall be coupled to the heat output of thermal solar panels, if selected. The use of these supplemental systems will be dependent on their life cycle cost and require further study.

Dual water tempering valve stations shall be provided at the water heater to maintain water heater temperatures above 140°F to prevent bacterial growth in the tank while delivering 125°F water to service fixtures for sanitation and 110°F hot water to public lavatory sinks and other student and public use fixtures to prevent scalding.

For the temporary modular structures, provide local electric tank type water heaters to support the restroom lavatory and Janitor sink fixtures.

Fixtures

Planned renovations will most likely require removal of the existing fixtures. Once removed the fixtures should be replaced with code compliant water conserving fixtures. In addition, to achieve improved LEED® compliance and further water savings we recommend ultra-low flush water closets and urinals be utilized. The ultra low flush water closets use 1.28 gallons per flush as opposed to the 1.6 gallon per flush allowed by today's code and the urinals use 1 pint (0.13 gallons) per flush as opposed to the current 1 gallon per flush allowed. The combination of these two can result in substantial savings overtime. However, these fixtures should only be used when connecting to new well pitched (more than code minimum) sewer lines as the low flow fixtures do have a tendency to result in line blockages if the sewer line pitch or conditions is not good.

Lavatory faucets shall be of the low flow metered type controlled by either a wired or battery powered sensor operated faucet. Use of these faucets promotes good hygiene as well as water conservation.

Natural Gas Service:

The existing gas service to the building currently supports the heating boilers, domestic water heaters and many of the rooftop units. The projected new load, gas-fired heating boilers, water heaters and cooking equipment will most likely exceed the current load due to increase in building size. Once loads are confirmed a review with the local gas utility (Eversource) shall take place to confirm adequate supply.

Sustainable Opportunities:

Many of the proposed fixtures and control sequences noted above minimize water usage and conserve energy however, further optimization may be obtained by investigating the use of storm water recovery systems. These systems collect, filter and utilize storm water to supply water to water closets and urinals throughout the building. A life cycle evaluation must be performed to ascertain the initial first costs, annual operating costs and projected savings associated with such a system.

Use of vacuum tube thermal solar panels shall be further considered, if desired, as part of a life cycle study analysis.

End of HVAC & Plumbing Narrative

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Date: December 11, 2019

To: Rob Para, AIA

Co: Lamoureux-Pagano Assoc. Architects, Inc. (via email)

From: Kevin Seaman. P.E. LEED® AP

Re: Doherty High School: **Preferred Schematic Report HVAC & Plumbing Narrative – New Construction Scheme A.1, A.2, A.3, B.1, C.2**

The following narrative describes the proposed scope of work pertaining to the heating, ventilation and air conditioning (HVAC) systems and the plumbing systems at the Doherty High School for the New Construction Option encompassing either of the A.1, A.2, A.3, B.1 or C.2 schemes.

HVAC

Central Heating Plant:

1. The buildings primary heat source shall be provided by high efficiency (93%+) gas-fired condensing hot water boilers. Pending final load calculations and system design, initially the boiler plant shall consist of four (4) gas-fired condensing fire-tube style boilers each with a gross input capacity of 3,000,000 BTUH similar to Lochinvar Crest or equal by Aerco or Viessman making for a total plant capacity of 12,000,000 BTUH. Boilers shall be located within a central boiler room. Combustion air and flue venting for the boilers shall run up the building to the roof level. Variable speed pumps shall be provided on each boiler tied to the boiler controller to optimize flow with boiler output.

2. Heating distribution to the building shall be via a 2-pipe hydronic hot water system (4-pipe chilled & hot water building system) complete with two (2) sets of tri-plex vertical in-line system pumps as manufactured by Armstrong, Grundfos or equal rated for the system flow for their respective building segments. Hydronic system shall connect to 2-pipe fan coil units, VAV terminals, unit heaters, hot water coils and fin-tube radiation located throughout the building. All terminals shall be designed to operate with a maximum water temperature of 140°F to maximize plant capacity. Pumps shall have premium efficient motors and be fitted with integral variable speed drives so that pump energy matches system flow demand.

3. Intermediate mechanical closets shall be provided on the upper level of the building and shall contain plate-frame heat exchangers and high efficiency pumps with variable speed ECM motors. These heat exchangers shall establish a water to glycol loop interface whereas all packaged rooftop equipment shall be fed with a glycol water mix for improved freeze protection.

Central Cooling Plant:

1. Due to the size and 4-story + nature of the structure we propose a central chilled water plant be utilized. As a minimum either multiple 250-ton + high efficiency air cooled chillers or water chillers would be utilized resulting in a total plant capacity of 500-tons + presuming the roof dehumidification equipment is supported by packaged air cooled equipment (otherwise tonnages would be higher). The plant capacity could grow as high as 750-tons if more chilled water equipment is used. The chillers would incorporate some form of water side economizer either through dry coolers or water decoupling heat exchanger to allow for chilled water operation in cooler months. Each chiller shall incorporate a set of variable speed pumps set to optimize chiller efficiency.
2. Chilled water distribution to the building shall be via a 2-pipe hydronic chilled water system (4-pipe chilled & hot water building system) complete with two (2) sets of tri-plex vertical in-line system pumps as manufactured by Armstrong, Grundfos or equal rated for the system flow for their respective building segments. Hydronic system shall connect to multiple chilled beams, chilled water coils and such located throughout the building. All terminals shall be designed to operate with a minimum water temperature of 58°F to maximize plant capacity. Pumps shall have premium efficient motors and be fitted with integral variable speed drives so that pump energy matches system flow demand.
3. Heat exchanger(s) shall establish a water to glycol loop interface to any exterior chiller or dry cooler to reduce seasonal maintenance. Remote condenser air cooled chiller options shall also be considered to minimize the need for chilled water and component exposure to weather.

Air Distribution and Ventilation:

1. New packaged rooftop units shall be provided which shall have total energy recovery wheels to utilize waste exhaust to temper incoming fresh air, hot water coils, chilled water and/or DX coils, modulating heat pipe and/or hot gas reheat coils for cooling and dehumidification control (see note below). Units shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery volumes based on space temperature and air quality demand as determined by CO2 sensors. The units shall be as manufactured by Aaon, Daiken, Valent or equal. Note: Consideration of air cooled DX vs chilled water cooling in roof top units shall be reviewed for the various systems with focus on long term energy efficiency, control of building humidity and maintenance.
2. Most all classrooms shall be provided with ventilation and air conditioning through the use of a mix of active and passive chilled beams. In areas where high latent loads may exist, the chilled beams shall incorporate condensate drain features or as a minimum moisture sensing switches. Fresh air shall be introduced through active chilled beams.
3. Science lab units shall be configured for 100% OA with exhaust adjusting to maintain space under slight negative pressure with respect to school as well as to match any fume hood exhaust. The units shall be as manufactured by Valent, Aaon, Daikin or equal.

4. Throughout the building exterior perimeter areas provide fin-tube radiation to support a majority of the space heating load. VAV and/or fan powered VAV units shall be used in all interior area or where fin-tube radiation is not possible or practical.

5. The computer classrooms as well as the MDF room shall be cooled via high efficiency ductless split units (one per room) with fan coil mounted within ceiling and condensing unit on roof.

6. Automotive shop area, if applicable, shall include a dedicated packaged rooftop system. The unit shall have total energy recovery wheels, hot water coils, DX or chilled water coils & hot gas reheat and/or heat pipe coils for cooling and dehumidification control. Unit shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery volumes based on space temperature and air quality demand as determined by CO and NOx sensors. The unit shall be as manufactured by Valent, Aaon, Daikin or equal.
7. High plume style fume hood exhaust fan(s) shall be provided and connected to science lab fume hoods. Fan shall vary flow based on variable flow hood demand. Each hood shall be fitted with sash airflow monitor and branch duct damper control as manufactured by TSI or Phoenix Controls to maintain flow at each hood based on open sash air velocity.
8. Provide kitchen hood ventilation system with energy saving smoke/heat detection systems coupled to variable speed exhaust fan. Provide new gas-fired make-up air system for the kitchen which shall have the ability to reset make-up air system volume in unison with kitchen hood exhaust demand control system. Outdoor make-up air shall be tempered heating only introduced directly in front of the kitchen hoods to minimize the need for cooling the air and impact on the room environment.
9. Locker rooms shall be provided with packaged rooftop units and supply and exhaust ductwork. The units shall have total energy recovery wheels and hot water coils and shall be configured for 100% OA ventilation during occupied periods. Units shall incorporate premium efficiency direct drive plenum fans on variable speed drives to optimize air delivery based on space temperature and air quality demand as determined by humidity and CO_2 sensors. The units shall be as manufactured by McQuay, Trane, Aaon or equal.
10. Restrooms (other than those in the locker room), Janitors closets, etc… shall be exhaust via roof mounted exhaust fans controlled by occupancy sensors located in the respective areas served.
11. In all options if atriums are employed that freely open to three or more floors, smoke evacuation systems shall be employed which reject smoke from the top of the atrium and introduce outside make-up air at the lowest levels. A 3rd party reviewer shall be employed to perform specialized CFD modeling to optimize system design as well as to perform code required peer review and testing.
12. In the A options on the original site, the segments of the structures considered high rise shall incorporate stair tower pressurization in the egress stairs. In addition, in floors which do not have sufficient exterior windows for smoke evacuation the HVAC system shall be

configured for use as a smoke evacuation system during clean-up by the fire department after a fire. This shall be not construed as a floor smoke control system.

13. In the A1 & A2 options there shall be a parking garage under a section of the building. The garage shall be provided with active outdoor air and exhaust ventilation systems controlled by both a CO and NO_2 monitoring system. The interstitial space between the garage ceiling and the floor above shall be provided with heat via hot water unit heaters.

Controls:

1. The city school system utilizes a proprietary control vendor current school Automated Building Systems, Inc. This provider shall incorporate a direct digital control (DDC) energy management system (EMS). The system shall control and monitor most all HVAC systems for efficient use and for proper indoor air quality and temperatures as well as incorporate energy saving routines. The system is designed on PC based architecture and adjustments are made on a graphics based presentation of building systems. The system also supports maintenance and record keeping needs of the facility. Occupancy of the school is based on the standard school year with occupied/unoccupied conditions based on current school day practice. This is an adjustable feature that can be made to reflect additional operating needs and use of the school building by staff or others.

2. The HVAC systems are generally operated on a school day basis coinciding with the occupied/unoccupied schedule of the standard 180-day school year. Adjustments can be made through the DDC system to allow for usage during periods other than the usual school operating periods.

3. Space temperature is monitored by individual space sensors that transmit data to the central monitoring and control station. Space conditions are adjustable through DDC system and can be modified to meet individual needs. Local control of space conditions is limited to predefined adjustments in space temperature and to facilitate a 3-hour occupied override feature.

4. All classroom systems shall incorporate space occupancy sensors to reset ventilation levels when room is unoccupied during a regularly scheduled occupied period. Systems serving high occupancy areas such as the cafeteria and gymnasium also include carbon dioxide (CO_2) indoor air quality (IAQ) sensors which optimize the fresh outdoor air ventilation levels in response to variations in space occupancies.

5. The system shall incorporate many energy-saving features such as 1) water temperature reset controls, 2) static pressure reset controls, 3) occupancy based controls and 4) ventilation reset controls to name just a few.

6. The building shall be connected to emergency power source for operation of heating boilers and pumps during loss of primary power. Systems on emergency power may include MDF and IDF rooms as well as areas deemed critical by the Owner.

Sustainable Opportunities:

Many of the proposed system and control sequences noted above minimize energy consumption however, further optimization may be obtained by investigating the use of high efficiency water cooled chillers which have inherently better energy performance than air cooled equipment albeit at a higher maintenance cost. A life cycle evaluation must be performed as size and length of cooling system run time will impact overall value.

In addition to the water cooled cooling option, consideration could also be given to a geothermal based option. A geothermal chiller/heater could support building cooling loads in the summer as well as provide supplemental heating to the building by preheating both the heating water and domestic hot water thereby reducing the demand on the building fossil fuel boilers. A geothermal well field analysis as well as a life cycle cost would need to be performed to verify economic viability.

Two solar based options to consider would be passive solar wall design using air passing through a wall assembly facing South to preheat air and/or vacuum tube thermal solar panels mounted on the roof to directly supplement the building heating and domestic hot water systems.

Plumbing

Distribution & Conveying Systems

The water distribution system throughout the building shall consist of copper piping with lead-free fittings and products. Although ‘A’ options built at the existing site employ some high rise features domestic water pressure boosters are not anticipated.

All sanitary sewer and rain water conductors shall be constructed of cast iron. An acid waste system consisting of acid rated piping and a neutralizing system shall be provided for the science labs.

All waste from the kitchen(s) shall be piped to a large (1,500 gallon+/-) exterior grease trap prior to discharge to the municipal sewer system.

Domestic Hot Water

High efficiency (93%+) gas-fired condensing boiler/water heaters and tanks shall be used to support the buildings domestic hot water needs. In addition, this system shall be coupled to the heat output of thermal solar panels, if selected. The use of these supplemental systems will be dependent on their life cycle cost and require further study.

Dual water tempering valve stations shall be provided at the water heater to maintain water heater temperatures above 140°F to prevent bacterial growth in the tank while delivering 125°F water to service fixtures for sanitation and 110°F hot water to public lavatory sinks and other student and public use fixtures to prevent scalding.

Fixtures

All fixtures shall be of the code compliant water conserving type. In addition, to achieve improved LEED® compliance and further water savings we recommend ultra-low flush water closets and urinals be utilized. The ultra low flush water closets use 1.28 gallons per flush as opposed to the 1.6 gallon per flush allowed by today's code and the urinals use 1 pint (0.13 gallons) per flush as opposed to the current 1 gallon per flush allowed. The combination of these two can result in substantial savings overtime. However, these fixtures should only be used when connecting to well-pitched (more than code minimum) sewer lines as the low flow fixtures do have a tendency to result in line blockages if the sewer line pitch is not good.

Lavatory faucets shall be of the low flow metered type controlled by either a wired or battery powered sensor operated faucet. Use of these faucets promotes good hygiene as well as water conservation.

Natural Gas Service:

All proposed sites appear to have gas service located either on property or on the public way abutting the property. It is anticipated that the gas service shall support the heating boilers, domestic water heaters, kitchen equipment and make-up air systems. Once loads are confirmed a review with the local gas utility (Eversource) shall take place to confirm adequate supply.

Sustainable Opportunities:

Many of the proposed fixtures and control sequences noted above minimize water usage and conserve energy however, further optimization may be obtained by investigating the use of storm water recovery systems. These systems collect, filter and utilize storm water to supply water to water closets and urinals throughout the building. A life cycle evaluation must be performed to ascertain the initial first costs, annual operating costs and projected savings associated with such a system.

Use of vacuum tube thermal solar panels shall be further considered, if desired, as part of a life cycle study analysis.

End of HVAC & Plumbing Narrative

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November 4, 2019

Doherty High School

Worcester, MA

RE: Electrical Recommendations – Code Upgrade

Prepared by Azim Rawji, P.E.

Under the code upgrade option, only the life safety systems will be upgraded, all other existing systems will remain and will continue to be used until they fail. Most of the existing systems are either past their useful working life or inadequate and need replacement.

Base Repair

a. Electrical Service:
    i. Existing electrical service and distribution equipment is to remain.
    ii. Provide new padmount transformer and distribution equipment to the modular classrooms.

b. Emergency Power:
    iii. Provide new emergency/standby generator and distribution equipment.

c. Lighting:
    i. Evaluate existing emergency egress and exist lighting.
    ii. Provide new egress and exit lighting to comply with current codes.

d. Fire Alarm:
    i. Provide new voice evacuation fire alarm system to comply with current codes.

e. Data Communications:
    ii. The existing telecommunications infrastructure is to remain.

f. Audio-Video Systems:
    i. Provide new public address and clock systems.
    ii. Provide assistive listening system at Auditorium, Cafeteria, Media Center, and Gymnasium.

g. Security Systems:
    i. The existing security system is to remain.

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Doherty High School

Worcester, MA

RE: Electrical Recommendations – Addition Renovation Narrative

Prepared by Azim Rawji, P.E.

Net Zero Energy

The City of Worcester has established efficient energy, sustainable design and net zero energy as a goal for the project. A net zero energy building is one that is optimally efficient and generates energy onsite using clean renewable resources in a quantity equal to or greater than the total amount of energy consumed onsite.

The building mechanical and electrical systems are the chief consumers of energy within the building. A combination of the following strategies contributes to the success in reducing energy demand from these systems.

a. Reduce Energy Demand – size mechanical equipment adequately, reduce plug and lighting loads, and improve the building shell.
b. Harvest Site Energy - Orient the building to maximize passive solar, and daylighting opportunities.
c. Maximize Efficiency - use efficient equipment to maximize benefit.
d. Efficient Operations and Maintenance – building commissioning, training of staff, and ongoing preventative maintenance, combined with monitoring of ongoing performance, can ensure energy efficiency gains are realized.
e. Renewable Energy - Generate enough energy on-site using renewable technologies to meet all energy demands for the facility.

As the project progresses, meetings and design charettes with the Owner will be planned and existing building performances will be evaluated to advance the efficient energy, sustainable design and net zero energy goals.

Enabling Early Site Package

a. Provide electrical infrastructure for temporary power.
b. Provide temporary site lighting and power.

Phase 1

Construct a 3-story Cafeteria, Science, Engineering Technology Academy (“ETA”, a Chapter 74 program), and mechanical spaces, as well as a 4 story Auditorium, Gymnasium, Administration and media center building. Maintain existing electrical, fire alarm, telecommunications and security systems in existing areas. Provide temporary electrical, fire alarm, telecommunications and security system connections to areas affected by demolition.

a. Electrical Service:
   i. Provide electrical primary duct bank to a utility company padmount transformer located on the exterior of the building.
   ii. Provide secondary electrical service conductors and main switchboard and distribution equipment to the main electrical room.
   iii. Provide telecommunications underground duct system to the entrance facility room.

b. Electrical Distribution
   i. Provide electrical distribution equipment and feeder.
   ii. Provide wiring devices and branch circuits.
   iii. Provide lightning protection system.
   iv. Provide roof mounted solar photovoltaic system.

c. Emergency Power:
   i. Provide emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.
   ii. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.
   iii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

d. Lighting:
   i. Provide light fixtures with LED lamps.
   ii. Provide network lighting control system including vacancy sensors and daylight harvesting.
   iii. Provide emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.
   iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
   v. Provide roadway and parking lot lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

e. Fire Alarm:
   i. Provide voice evacuation fire alarm system.
   ii. Provide public safety radio distributed antenna system.
   iii. Provide area of refuge communications system.

f. Data Communications:

    i. Provide telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6A cabling for voice and data drops. Install telecommunications equipment in dedicated rooms.
    ii. Provide data network switches based on HP Procurve (Aruba Enterprise Company).
    iii. Provide wireless access points based on Cisco Meraki.
    iv. Provide VoIP telephone system and handsets based on Mitel.

g. Audio-Video Systems:
    i. Provide sound system in the gym/auditorium.
    ii. Provide in-building classroom audio system.
    iii. Provide in-building cellular amplification system.
    iv. Provide handheld radio amplification system.
    v. Provide public address system.
    vi. Provide digital signage and clock system.

h. Security Systems:
    i. Provide video surveillance system based on Genetec VMS and Axis cameras.
    ii. Provide access control system based on HID.
    iii. Provide intrusion detection system based on Bosch.

Phase 2

Sequence 2A will involve occupancy of phase 1 spaces. Sequence 2B involves demolition of the buildings containing the Gym/Physical Education support spaces and ETA as well as the west ends of both building containing the Cafeteria, Art Rooms, Classrooms and some Special Education rooms. Sequence 2C involves gut renovation of Auditorium, Science Classrooms and Classrooms below science rooms.

a. Electrical Distribution:
    i. Provide electrical distribution and feeder.
    ii. Provide wiring devices and branch circuits.
    iii. Provide lightning protection system.
    iv. Provide roof mounted solar photovoltaic system.

b. Emergency Power:
    i. Provide emergency distribution and feeders.
    ii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

c. Lighting:
    i. Provide light fixtures with LED lamps.
    ii. Provide network lighting control system including vacancy sensors and daylight harvesting.
    iii. Provide emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.

- iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
- v. Provide roadway and parking lot lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

d. Fire Alarm:
- i. Provide fire alarm devices.
- ii. Provide public safety radio distributed antennas.
- iii. Provide area of refuge communications system.

e. Data Communications:
- i. Provide telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6A cabling for voice and data drops. Install telecommunications equipment in dedicated rooms.
- ii. Provide data network switches.
- iii. Provide wireless access points.
- iv. Provide VoIP handsets.

f. Audio-Video Systems:
- i. Provide sound system in the cafetorium.
- ii. Provide in-building classroom audio system.
- iii. Provide in-building cellular amplification system.
- iv. Provide handheld radio amplification system.
- v. Provide public address system.
- vi. Provide digital signage and clock system.

g. Security Systems:
- i. Provide video surveillance cameras.
- ii. Provide access control card readers.
- iii. Provide intrusion detection devices.

Phase 3

Sequence 3A involves occupying newly renovated and newly built spaces including new Administration/Guidance/Medical Suite, Art Classrooms, General Classrooms in renovated areas as well as new General Classrooms in newly constructed academic wings. Sequence 3B involves the gut/renovation of remaining spaces, the former Administration Suite with library above and the remaining classrooms within that area as well as the group of classrooms adjacent to the former gym.

a. Electrical Distribution:
- i. Provide electrical distribution and feeder.
- ii. Provide wiring devices and branch circuits.
- iii. Provide lightning protection system.

iv. Provide roof mounted solar photovoltaic system.

b. Emergency Power:
   i. Provide emergency distribution and feeders.
   ii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

c. Lighting:
   i. Provide light fixtures with LED lamps.
   ii. Provide network lighting control system including vacancy sensors and daylight harvesting.
   iii. Provide emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.
   iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
   v. Provide roadway and parking lot lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

d. Fire Alarm:
   i. Provide fire alarm devices.
   ii. Provide public safety radio distributed antennas.
   iii. Provide area of refuge communications system.

e. Data Communications:
   i. Provide telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6A cabling for voice and data drops. Install telecommunications equipment in dedicated rooms.
   ii. Provide data network switches.
   iii. Provide wireless access points.
   iv. Provide VoIP handsets.

f. Audio-Video Systems:
   i. Provide sound system in the cafetorium.
   ii. Provide in-building classroom audio system.
   iii. Provide handheld radio amplification system.
   iv. Provide public address system.
   v. Provide digital signage and clock system.

g. Security Systems:
   i. Provide video surveillance cameras.
   ii. Provide access control card readers.
   iii. Provide intrusion detection devices.

Phase IV

Sequence 4A involves occupying newly renovated classrooms. Sequence 4B involves construction of the multipurpose field and finishing site and landscaping scope.

a. Electrical Distribution:
   i. Provide electrical distribution and feeder.
   ii. Provide wiring devices and branch circuits.
   iii. Provide lightning protection system.
   iv. Provide parking canopy mounted solar photovoltaic system.
   v. Provide electric vehicle charging stations.

b. Emergency Power:
   i. Provide emergency distribution and feeders.
   ii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

c. Lighting:
   i. Provide light fixtures with LED lamps.
   ii. Provide network lighting control system including vacancy sensors and daylight harvesting.
   iii. Provide emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.
   iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
   v. Provide roadway, parking lot and athletic field lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

d. Fire Alarm:
   i. Provide fire alarm devices.
   ii. Provide public safety radio distributed antennas.
   iii. Provide area of refuge communications system.

e. Data Communications:
   i. Provide telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6A cabling for voice and data drops. Install telecommunications equipment in dedicated rooms.
   ii. Provide data network switches.
   iii. Provide wireless access points.
   iv. Provide VoIP handsets.

f. Audio-Video Systems:
   i. Provide sound system in the athletic field.
   ii. Provide in-building classroom audio system.

iii. Provide handheld radio amplification system.
iv. Provide public address system.
v. Provide digital signage and clock system.

g. Security Systems:
i. Provide video surveillance cameras.
ii. Provide access control card readers.
iii. Provide intrusion detection devices.

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November 4, 2019

Doherty High School

Worcester, MA

RE: Electrical Recommendations – A.1 New Construction on Existing Site-Pods on Park Narrative

Prepared by Azim Rawji, P.E.

Net Zero Energy

The City of Worcester has established efficient energy, sustainable design and net zero energy as a goal for the project. A net zero energy building is one that is optimally efficient and generates energy onsite using clean renewable resources in a quantity equal to or greater than the total amount of energy consumed onsite.

The building mechanical and electrical systems are the chief consumers of energy within the building. A combination of the following strategies contributes to the success in reducing energy demand from these systems.

a. Reduce Energy Demand – size mechanical equipment adequately, reduce plug and lighting loads, and improve the building shell.
b. Harvest Site Energy - Orient the building to maximize passive solar, and daylighting opportunities.
c. Maximize Efficiency - use efficient equipment to maximize benefit.
d. Efficient Operations and Maintenance – building commissioning, training of staff, and ongoing preventative maintenance, combined with monitoring of ongoing performance, can ensure energy efficiency gains are realized.
e. Renewable Energy - Generate enough energy on-site using renewable technologies to meet all energy demands for the facility.

As the project progresses, meetings and design charettes with the Owner will be planned and existing building performances will be evaluated to advance the efficient energy, sustainable design and net zero energy goals.

New Construction

a. Electrical Service:
    i. Provide electrical primary duct bank to a utility company padmount transformer located on the exterior of the building.
    ii. Provide new secondary electrical service conductors and new main switchboard and distribution equipment to a new main electrical room.
    iii. Provide new telecommunications underground duct system to a new server room.
    iv. Provide new electrical distribution and branch circuits.

- v. Coordinate with utility company to disconnect power to the existing building at the end of construction to facilitate demolition by the General Contractor.

b. Electrical Distribution
- i. Provide electrical distribution equipment and feeder.
- ii. Provide wiring devices and branch circuits.
- iii. Provide lightning protection system.
- iv. Provide roof and parking canopy mounted solar photovoltaic system.

c. Emergency Power:
- i. Provide new emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.
- ii. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.
- iii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

d. Lighting:
- i. Provide new emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.
- ii. Provide new light fixtures with LED lamps.
- iii. Provide new network lighting control system including occupancy sensors and daylight harvesting.
- iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
- v. Provide roadway, parking lot and athletic field lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

e. Fire Alarm:
- i. Provide new voice evacuation fire alarm system.
- ii. Provide new public safety radio distributed antenna system.
- iii. Provide area of refuge communications system.

f. Data Communications:
- i. Provide new telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6 cabling for voice and data drops and Category 6A shielded cabling for wireless access points. Install telecommunications equipment in dedicated rooms.
- ii. Provide data network switches based on HP Procurve (Aruba Enterprise Company).
- iii. Provide wireless access points based on Cisco Meraki.
- iv. Provide VoIP telephone system and handsets based on Mitel.

g. Audio-Video Systems:
  i. Provide new sound system in the gym/cafetorium/auditorium/athletic field.
  ii. Provide in-building classroom audio system.
  iii. Provide in-building cellular amplification system.
  iv. Provide handheld radio amplification system.
  v. Provide public address system.
  vi. Provide digital signage and clock system.

h. Security Systems:
  i. Provide new video surveillance system based on Genetec.
  ii. Provide new access control system based on HID.
  iii. Provide intrusion detection system based on DMP.

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November 4, 2019

Doherty High School

Worcester, MA

RE: Electrical Recommendations – A.2 New Construction on Existing Site-Olmsted Homage Narrative

Prepared by Azim Rawji, P.E.

Net Zero Energy

The City of Worcester has established efficient energy, sustainable design and net zero energy as a goal for the project. A net zero energy building is one that is optimally efficient and generates energy onsite using clean renewable resources in a quantity equal to or greater than the total amount of energy consumed onsite.

The building mechanical and electrical systems are the chief consumers of energy within the building. A combination of the following strategies contributes to the success in reducing energy demand from these systems.

a. Reduce Energy Demand – size mechanical equipment adequately, reduce plug and lighting loads, and improve the building shell.
b. Harvest Site Energy - Orient the building to maximize passive solar, and daylighting opportunities.
c. Maximize Efficiency - use efficient equipment to maximize benefit.
d. Efficient Operations and Maintenance – building commissioning, training of staff, and ongoing preventative maintenance, combined with monitoring of ongoing performance, can ensure energy efficiency gains are realized.
e. Renewable Energy - Generate enough energy on-site using renewable technologies to meet all energy demands for the facility.

As the project progresses, meetings and design charettes with the Owner will be planned and existing building performances will be evaluated to advance the efficient energy, sustainable design and net zero energy goals.

New Construction

a. Electrical Service:
    i. Provide electrical primary duct bank to a utility company padmount transformer located on the exterior of the building.
    ii. Provide new secondary electrical service conductors and new main switchboard and distribution equipment to a new main electrical room.
    iii. Provide new telecommunications underground duct system to a new server room.
    iv. Provide new electrical distribution and branch circuits.

v. Coordinate with utility company to disconnect power to the existing building at the end of construction to facilitate demolition by the General Contractor.

b. Electrical Distribution

i. Provide electrical distribution equipment and feeder.

ii. Provide wiring devices and branch circuits.

iii. Provide lightning protection system.

iv. Provide solar photovoltaic system.

c. Emergency Power:

i. Provide new emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.

ii. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.

iii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

d. Lighting:

i. Provide new emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.

ii. Provide new light fixtures with LED lamps.

iii. Provide new network lighting control system including occupancy sensors and daylight harvesting.

iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.

v. Provide roadway, parking lot and athletic field lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

e. Fire Alarm:

i. Provide new voice evacuation fire alarm system.

ii. Provide new public safety radio distributed antenna system.

iii. Provide area of refuge communications system.

f. Data Communications:

i. Provide new telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6 cabling for voice and data drops and Category 6A shielded cabling for wireless access points. Install telecommunications equipment in dedicated rooms.

ii. Provide data network switches based on HP Procurve (Aruba Enterprise Company).

iii. Provide wireless access points based on Cisco Meraki.

iv. Provide VoIP telephone system and handsets based on Mitel.

g. Audio-Video Systems:
  - i. Provide new sound system in the gym/cafetorium/auditorium/athletic field.
  - ii. Provide in-building classroom audio system.
  - iii. Provide in-building cellular amplification system.
  - iv. Provide handheld radio amplification system.
  - v. Provide public address system.
  - vi. Provide digital signage and clock system.

h. Security Systems:
  - i. Provide new video surveillance system based on Genetec.
  - ii. Provide new access control system based on HID.
  - iii. Provide intrusion detection system based on DMP.

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November 4, 2019

Doherty High School
Worcester, MA

RE: Electrical Recommendations – A.3 New Construction on Existing Site-Highland Proud Narrative

Prepared by Azim Rawji, P.E.

Net Zero Energy

The City of Worcester has established efficient energy, sustainable design and net zero energy as a goal for the project. A net zero energy building is one that is optimally efficient and generates energy onsite using clean renewable resources in a quantity equal to or greater than the total amount of energy consumed onsite.

The building mechanical and electrical systems are the chief consumers of energy within the building. A combination of the following strategies contributes to the success in reducing energy demand from these systems.

a. Reduce Energy Demand – size mechanical equipment adequately, reduce plug and lighting loads, and improve the building shell.
b. Harvest Site Energy - Orient the building to maximize passive solar, and daylighting opportunities.
c. Maximize Efficiency - use efficient equipment to maximize benefit.
d. Efficient Operations and Maintenance – building commissioning, training of staff, and ongoing preventative maintenance, combined with monitoring of ongoing performance, can ensure energy efficiency gains are realized.
e. Renewable Energy - Generate enough energy on-site using renewable technologies to meet all energy demands for the facility.

As the project progresses, meetings and design charettes with the Owner will be planned and existing building performances will be evaluated to advance the efficient energy, sustainable design and net zero energy goals.

New Construction

a. Electrical Service:
    i. Provide electrical primary duct bank to a utility company padmount transformer located on the exterior of the building.
    ii. Provide new secondary electrical service conductors and new main switchboard and distribution equipment to a new main electrical room.
    iii. Provide new telecommunications underground duct system to a new server room.
    iv. Provide new electrical distribution and branch circuits.

  v. Coordinate with utility company to disconnect power to the existing building at the end of construction to facilitate demolition by the General Contractor.

b. Electrical Distribution
  i. Provide electrical distribution equipment and feeder.
  ii. Provide wiring devices and branch circuits.
  iii. Provide lightning protection system.
  iv. Provide solar photovoltaic system.

c. Emergency Power:
  i. Provide new emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.
  ii. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.
  iii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

d. Lighting:
  i. Provide new emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.
  ii. Provide new light fixtures with LED lamps.
  iii. Provide new network lighting control system including occupancy sensors and daylight harvesting.
  iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
  v. Provide roadway, parking lot and athletic field lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

e. Fire Alarm:
  i. Provide new voice evacuation fire alarm system.
  ii. Provide new public safety radio distributed antenna system.
  iii. Provide area of refuge communications system.

f. Data Communications:
  i. Provide new telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6 cabling for voice and data drops and Category 6A shielded cabling for wireless access points. Install telecommunications equipment in dedicated rooms.
  ii. Provide data network switches based on HP Procurve (Aruba Enterprise Company).
  iii. Provide wireless access points based on Cisco Meraki.
  iv. Provide VoIP telephone system and handsets based on Mitel.

g. Audio-Video Systems:
   i. Provide new sound system in the gym/cafetorium/auditorium/athletic field.
   ii. Provide in-building classroom audio system.
   iii. Provide in-building cellular amplification system.
   iv. Provide handheld radio amplification system.
   v. Provide public address system.
   vi. Provide digital signage and clock system.

h. Security Systems:
   i. Provide new video surveillance system based on Genetec.
   ii. Provide new access control system based on HID.
   iii. Provide intrusion detection system based on DMP.

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November 4, 2019

Doherty High School
Worcester, MA

RE: Electrical Recommendations – B.1 New Construction on Foley Stadium Site Narrative

Prepared by Azim Rawji, P.E.

Net Zero Energy
The City of Worcester has established efficient energy, sustainable design and net zero energy as a goal for the project. A net zero energy building is one that is optimally efficient and generates energy onsite using clean renewable resources in a quantity equal to or greater than the total amount of energy consumed onsite.

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c. Maximize Efficiency - use efficient equipment to maximize benefit.
d. Efficient Operations and Maintenance – building commissioning, training of staff, and ongoing preventative maintenance, combined with monitoring of ongoing performance, can ensure energy efficiency gains are realized.
e. Renewable Energy - Generate enough energy on-site using renewable technologies to meet all energy demands for the facility.

As the project progresses, meetings and design charettes with the Owner will be planned and existing building performances will be evaluated to advance the efficient energy, sustainable design and net zero energy goals.

New Construction

a. Electrical Service:
    i. Provide electrical primary duct bank to a utility company padmount transformer located on the exterior of the building.
    ii. Provide new secondary electrical service conductors and new main switchboard and distribution equipment to a new main electrical room.
    iii. Provide new telecommunications underground duct system to a new server room.
    iv. Provide new electrical distribution and branch circuits.

v. Coordinate with utility company to disconnect power to the existing building at the end of construction to facilitate demolition by the General Contractor.

b. Electrical Distribution
   i. Provide electrical distribution equipment and feeder.
   ii. Provide wiring devices and branch circuits.
   iii. Provide lightning protection system.
   iv. Provide solar photovoltaic system.

c. Emergency Power:
   i. Provide new emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.
   ii. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.
   iii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

d. Lighting:
   i. Provide new emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.
   ii. Provide new light fixtures with LED lamps.
   iii. Provide new network lighting control system including occupancy sensors and daylight harvesting.
   iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
   v. Provide roadway, parking lot and athletic field lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

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  i. Provide new sound system in the gym/cafetorium/auditorium/athletic field.
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  iv. Provide handheld radio amplification system.
  v. Provide public address system.
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November 4, 2019

Doherty High School

Worcester, MA

RE: Electrical Recommendations – C.2 New Construction on Chandler Magnet School Site with Added Land Narrative

Prepared by Azim Rawji, P.E.

Net Zero Energy

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The building mechanical and electrical systems are the chief consumers of energy within the building. A combination of the following strategies contributes to the success in reducing energy demand from these systems.

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- b. Harvest Site Energy - Orient the building to maximize passive solar, and daylighting opportunities.
- c. Maximize Efficiency - use efficient equipment to maximize benefit.
- d. Efficient Operations and Maintenance – building commissioning, training of staff, and ongoing preventative maintenance, combined with monitoring of ongoing performance, can ensure energy efficiency gains are realized.
- e. Renewable Energy - Generate enough energy on-site using renewable technologies to meet all energy demands for the facility.

As the project progresses, meetings and design charettes with the Owner will be planned and existing building performances will be evaluated to advance the efficient energy, sustainable design and net zero energy goals.

New Construction

- a. Electrical Service:
  - i. Provide electrical primary duct bank to a utility company padmount transformer located on the exterior of the building.
  - ii. Provide new secondary electrical service conductors and new main switchboard and distribution equipment to a new main electrical room.
  - iii. Provide new telecommunications underground duct system to a new server room.
  - iv. Provide new electrical distribution and branch circuits.

v. Coordinate with utility company to disconnect power to the existing building at the end of construction to facilitate demolition by the General Contractor.

b. Electrical Distribution
i. Provide electrical distribution equipment and feeder.
ii. Provide wiring devices and branch circuits.
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iv. Provide solar photovoltaic system.

c. Emergency Power:
i. Provide new emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.
ii. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.
iii. Provide power to emergency egress and exit lighting, life safety and standby equipment.

d. Lighting:
i. Provide new emergency egress and exit lighting fed from the emergency life safety branch of the emergency/standby system.
ii. Provide new light fixtures with LED lamps.
iii. Provide new network lighting control system including occupancy sensors and daylight harvesting.
iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
v. Provide roadway, parking lot and athletic field lighting. The exterior lighting will have the appropriate cut-offs to reduce light pollution and be considerate to the residential neighbors.

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i. Provide new voice evacuation fire alarm system.
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iii. Provide wireless access points based on Cisco Meraki.
iv. Provide VoIP telephone system and handsets based on Mitel.

g. Audio-Video Systems:
  - i. Provide new sound system in the gym/cafetorium/auditorium/athletic field.
  - ii. Provide in-building classroom audio system.
  - iii. Provide in-building cellular amplification system.
  - iv. Provide handheld radio amplification system.
  - v. Provide public address system.
  - vi. Provide digital signage and clock system.

h. Security Systems:
  - i. Provide new video surveillance system based on Genetec.
  - ii. Provide new access control system based on HID.
  - iii. Provide intrusion detection system based on DMP.

Introduction

The MSBA space requirements provide 2,790 square feet for a full-service kitchen and serving area, and an additional 600 square feet (SF) for a “scramble” style serving area under the current guidelines based on student population. Therefore, the total square footage under the current guidelines allowed would be 3,570 SF. The existing kitchen and serving area has approximately 2,996 SF, which is 575 SF smaller than that allotted MSBA guidelines. However, our team is proposing 3,150 SF of kitchen and serving space, which is 360 SF larger than allotted guideline. In addition, we are proposing another 3,000 SF for the “scramble” style servery, for a total of 6,150 SF of kitchen and serving space. This is based on past experience with similar size and scope projects and the benchmarking information which supports the proposed. Based on the proposed square footage at $200.00 per square foot, the estimated foodservice equipment budget for this project would be $1,230,000.00. This is for all new equipment delivered and set-in place, it does not include hard construction costs or final connections by trades. In addition, there will be a satellite Grab-N-Go which will be 200 SF.

Recommendations: Kitchen and Serving – Base Repair

- All new NSF approved shelving should be provided for walk-in cooler and freezer.
- The cooking equipment has reached its life expectancy and needs to be replaced with energy efficient units that meet the specification for the future operations, with flexibility for changes in operation and menu.
- New food warmers are needed to hold bulk food in advance and utilize current technology to keep food quality; this can meet the demands of large bursts of service in a short period of time without limiting the menu choices.
- Provide all new work tables and configure efficiently between preparation and cooking areas.
- Provide handsinks for all serving, cooking, working, dishwashing and pot washing areas.
- Renovate the mop closet. Provide a new NSF approved mop sink, easily cleaned water-proof wall panels and adequate shelving space for the proper storage of cleaning chemicals. Provide a lock on the closet door or locking cabinet for chemicals. Remove washing machine and relocate.
- Provide all new serving counters and sneeze guards that meet all current NSF and ADA codes with storage below.
- Refrigerated display cases should be available to hold pre-made salads, sandwiches, fruit and specialty items. This provides variety to students that dine here every day, and at the same time provides relief to serving lines by providing options.

Recommendations: Kitchen and Serving – Additions/Renovations

- The foodservice equipment is in need of complete replacement.
- All exposed components of the interior in the kitchen/serving area require renovation.
- The walk-in cooler and freezer should be demolished and replaced with new energy efficient units.
- The cooler size should be double its current size.
- All new NSF approved shelving should be provided for walk-in cooler and freezer.
- The cooking equipment has reached its life expectancy and needs to be replaced with energy efficient units that meet the specification for the future operations, with flexibility for changes in operation and menu.
- New food warmers are needed to hold bulk food in advance and utilize current technology to keep food quality; this can meet the demands of large bursts of service in a short period of time without limiting the menu choices.
- Provide all new work tables and configure efficiently between preparation and cooking areas.
- Provide handsinks for all serving, cooking, working, dishwashing and pot washing areas.
- Provide larger dry food storage with NSF approved shelving in an efficient layout.
- Install new LED recessed lighting fixtures and increase lighting in the kitchen area in general.
- Remove the existing exhaust hood(s) and provide energy efficient units with on demand ventilation.
- Trash and recycling should have dedicated space for proper disposal during lunch and storage between pick-ups.
- Renovate the mop closet. Provide a new NSF approved mop sink, easily cleaned water-proof wall panels and adequate shelving space for the proper storage of cleaning chemicals. Provide a lock on the closet door or locking cabinet for chemicals. Remove washing machine and relocate.
- Demolish the current dishroom and provide a new properly sized area with a new dishmachine and dish tables to accommodate the current and projected use of disposable trays and pot and pan washing in the kitchen.
- Provide new lockers for staff that equal the amount of employees.
- Provide all new serving counters and sneeze guards that meet all current NSF and ADA codes with storage below.
- Add refrigerated display to the serving counters for menu options and food safety.
- Increase the size of the office to allow for normal layout and function in the space.
- Provide a larger dedicated receiving area for foodservice that incorporates space for staging deliveries, breaking down and easy transport to food storage areas.
- Renovated or new construction, the facility should have the ability to provide an open market style servery with all the typical aspects of a current high school foodservice program.

- Menu offerings should speak to the diversity of the population and current/future trends. The equipment should support this diversity.
- Refrigerated display cases should be available to hold pre-made salads, sandwiches, fruit and specialty items. This provides variety to students that dine here every day, and at the same time provides relief to serving lines by providing options.
- All exposed components of the interior in the kitchen/serving area require renovation.
- The walk-in cooler and freezer should be demolished and replaced with new energy efficient units.
- The cooler size should be double its current size.
- All new NSF approved shelving should be provided for walk-in cooler and freezer.
- The cooking equipment has reached its life expectancy and needs to be replaced with energy efficient units that meet the specification for the future operations, with flexibility for changes in operation and menu.
- New food warmers are needed to hold bulk food in advance and utilize current technology to keep food quality; this can meet the demands of large bursts of service in a short period of time without limiting the menu choices.
- Provide all new work tables and configure efficiently between preparation and cooking areas.
- Provide handsinks for all serving, cooking, working, dishwashing and pot washing areas.
- Provide larger dry food storage with NSF approved shelving in an efficient layout.
- Install new LED recessed lighting fixtures and increase lighting in the kitchen area in general.
- Remove the existing exhaust hood(s) and provide energy efficient units with on demand ventilation.
- Trash and recycling should have dedicated space for proper disposal during lunch and storage between pick-ups.
- Demolish the current dishroom and provide a new properly sized area with a new dishmachine and dish tables to accommodate the current and projected use of disposable trays and pot and pan washing in the kitchen.
- Renovate the mop closet. Provide a new NSF approved mop sink, easily cleaned water-proof wall panels and adequate shelving space for the proper storage of cleaning chemicals. Provide a lock on the closet door or locking cabinet for chemicals. Remove washing machine and relocate.
- Provide new lockers for staff that equal the amount of employees.
- Renovate restrooms and make ADA compliant.
- Provide all new serving counters and sneeze guards that meet all current NSF and ADA codes with storage below.
- Add refrigerated display to the serving counters for menu options and food safety.
- Increase the size of the office to allow for normal layout and function in the space.

- Provide a larger dedicated receiving area for foodservice that incorporates space for staging deliveries, breaking down and easy transport to food storage areas.
- Provide additional storage and preparation equipment to facilitate the bulk production of salads and individual packaging of salad product for distribution to all other high schools in the district.
- The kitchen and seating areas will benefit from a more open, clean and ventilated space.
- Renovated or new construction, the facility should have the ability to provide an open market style servery with all the typical aspects of a current high school foodservice program.
- Menu offerings should speak to the diversity of the population and current/future trends. The equipment should support this diversity.
- Refrigerated display cases should be available to hold pre-made salads, sandwiches, fruit and specialty items. This provides variety to students that dine here every day, and at the same time provides relief to serving lines by providing options.
- There will be improved control over food deliveries, storage (dry and refrigerated), work flow, disposal of waste and ware washing.
- In addition, a renovation or a newly constructed kitchen will provide the opportunity to bring all plumbing, electrical, HVAC, life safety and health codes up to current standards and codes, which are much needed under the existing conditions.
- Provide new 200 SF satellite Grab-N-Go.

Recommendations: Kitchen and Serving – New Construction

- For new construction it is assumed all recommendations above for base repair and additions/renovations would be incorporated into the design of a new facility.

3.3.3 FINAL EVALUATION OF ALTERNATIVES

D. Supporting Documents

2. Permitting Requirements (all options)

#	AGENCY	PERMIT/ISSUE	COMMENTS	STATUS	FEE
1	Massachusetts DEP/Worcester Conservation Commission	WPA Form 4A Abbreviated Notice of Resource Area Delineation	Wetlands and Riverfront Areas have been flagged and located on the site plan	Not Required (no wetlands present on any of the sites)	NA
2	Worcester Conservation Commission	WPA Form 3 (NOI) Notice of Intent	Local project review for compliance with the performance standards of the City of Worcester Wetlands Ordinance.	To be filed during Design Development phase; 3-6 month duration	NA
3	Worcester Conservation Commission	WPA Form 5 Order of Conditions	Issued after NOI, to be published with the specifications and recorded at Registry of Deeds	To be published with 60% Construction Documents early site package	$75.00 recording fee
4	Worcester Conservation Commission	WPA Form 8A, 8B Request for & Certificate of Compliance	Requested by Owner or Contractor at completion of project	Pending completion of work and as-built drawing	NA
5	US EPA	Stormwater Pollution Protection Plan (SWPPP) approval	Draft required per Order of Conditions; required prior to NPDES NOI filing; draft SWPPP to be included with WPA NOI; refer to Item #6 below	Pending prior to beginning of construction	NA
6	US EPA	National Pollutant Discharge Elimination System (NPDES) NOI for Discharge Associated with Construction Activity and Notice of Termination (NOT)	Filed by Contractor (NOI system) prior to construction and at project completion	Pending; NOI at least 14 days prior to beginning of construction	NA
7	Environmental Notification Form (ENF) 301cmr 11.00	Executive Office of Energy and Environmental Affairs MEPA	Section 11.03: Review Thresholds Possible thresholds for ENF include creation of 5 or more acres of impervious area (Foley site); generation of 2,000 or more new daily trips	Pending: If required, ENF would be filed following completion of Schematic Design Phase; 40 days from filing to	NA

#	AGENCY	PERMIT/ISSUE	COMMENTS	STATUS	FEE
			(Chandler & Foley sites); and creation of 300 or more new parking spaces (Chandler & Foley sites).	determination for EIR requirement by MA Sec. of Environmental Affairs.	
8	Environmental Impact Report (EIR) 301cmr 11.00	Executive Office of Energy and Environmental Affairs MEPA	Section 11.03: Review Thresholds Possible mandatory EIR threshold includes generation of 3,000 or more new daily trips (Foley site).	Pending; to be filed during the Design Development Phase; 60 days from filing to determination of adequacy of mitigation by the Sec. of Environmental Affairs.	NA
9	Project Notification Form for Historic Buildings or Archeological MHC 950 CMR	Massachusetts Historical Commission Project Notification Form	Required for any project receiving state or federal funding	To be filed during Schematic Design phase	NA
10	City of Worcester-Demolition Delay Ordinance	Historical Commission	Not required, -none of the sites are on listed 0n the MACRIS List	To be filed during Design Development phase	NA
11	City of Worcester	Sewer Connection	Reviewed by DPW	Pending; prior to beginning of construction-	TBD
12	Massachusetts DEP	Sewer Extension Permit	Not required	N/A	N/A
13	City of Worcester	Water Connection			TBD
14	City of Worcester-Hydrant flow test	Water/Fire Department	To be done during SD		
15	City of Worcester	Development Review Board	Periodic reviews		NA
16	National Grid	New electrical service for school	Work request to be submitted Preliminary review with the N-GRID during SD	Backcharge to be determined, Review at the DD/ CD phase	TBD
17	National Grid	Temporary electric	Work request to be	By Contractor prior	TBD

#	AGENCY	PERMIT/ISSUE	COMMENTS	STATUS	FEE
		service (if required)	submitted	to construction	
18	Eversourse	Revised gas service and new meter for boilers	Preliminary loads and service/meter location to be reviewed w/ N-Grid representative	To be reviewed during Schematic Design phase	TBD
19	State Plumbing Board	Elevated pressure gas service	TBD	TBD	TBD
20	National Grid	Comprehensive Design Approach rebate program	Independent energy modeling study must be performed	Review at the Schematic Design phase	
21	Massachusetts DEP	Asbestos Removal Permit & Notifications	Requirements outlined in Hazardous Materials Identification Report.	Pending; beginning of construction or demolition	TBD
22	Massachusetts DEP	BWP AQ06 Notification	Filed by Contractor prior to construction	Pending; beginning of construction	TBD
23	City of Worcester	Site Plan Review	Pre-Application Review by Interdepartmental Review Team (IRT) for compliance with municipal site design standards	To be presented during Design Development phase; IRT meets weekly; 3-6 month duration	
24	Massachusetts AAB Architectural Access Board	Application for Variance (if required)	Possible Variance for relief If new trails are installed at Newton Hill as making accessible may be impractical.	If required, to be filed during Design Development phase	$50
25	City of Worcester	Disabilities Board	General review	To be reviewed with the IRT review	NA
26	Land taking	Law Department	Eminent domain If the schemes that require land taking are selected	Not a permit, but a land issue to track	
27	City of Worcester	Building Department (including Electrical and Plumbing)	Final required for Building Permit filing	To be reviewed during Schematic Design and subsequent phases	NA
28	City of Worcester	Police/Fire Departments, School Resource Officer, DPW, Board of Health	Review safety and security protocol, including access road issues	To be reviewed with IRT during Schematic Design and subsequent	NA

#	AGENCY	PERMIT/ISSUE	COMMENTS	STATUS	FEE
				phases	
29	City of Worcester	Demolition Permit	Filed by Contractor prior to construction.		TBD
30	City of Worcester	Building Permit, Certificate of Occupancy	Filed by Contractor prior to construction		TBD

3.3.3 FINAL EVALUATION OF ALTERNATIVES

D. Supporting Documents

3. Offsite Improvements (all options)

DUFFY FIELD IMPROVEMENTS – PROPOSED SCOPE

- Site Development, including Field Underdrains
- New Synthetic Turf Multi-purpose Field
- New Field Lighting
- Added Access and Parking
- Buffer Landscaping and General Improvements
- Budget includes Construction Costs, Contingency, and Fees

TOTAL BUDGET $4.5 MILLION

FOLEY STADIUM ADDED LAND – PROPOSED SCOPE

- Land Acquisition
- Grading and Retaining Walls
- New Basketball or Tennis Courts
- Field Access from Pleasant Street, Parking and Drop-off
- Buffer Landscaping and General Improvements
- Budget includes Construction Costs, Contingency, and Fees

TOTAL BUDGET $1.5 MILLION

FOLEY STADIUM REAR FIELDS IMPROVEMENTS – PROPOSED SCOPE

- New Synthetic Turf at Soccer, Field Hockey, Baseball Outfield
- Field Underdrains
- Budget includes Construction Costs, Contingency, and Fees
- New Field Lighting

TOTAL BUDGET $5–7 MILLION

BEAVER BROOK PRACTICE FIELD IMPROVEMENTS – PROPOSED SCOPE

- Provide Field Underdrains and Expanded Grass Practice Field
- Budget includes Construction Costs, Contingency, and Fees

TOTAL BUDGET $575,000

3.3.3 FINAL EVALUATION OF ALTERNATIVES

E. Budget Comparison

1. Narrative
2. Construction Cost Estimates
3. Preliminary Design Pricing Table

The Budget Comparison process during the Final Evaluation of Alternatives was informed and impacted by several factors as follows:

- The PSR budget estimates were calculated assuming the Ch.149a Construction Manager at Risk delivery method would be use.
- The project duration, in terms of months, varies depending on the option; phased/occupied Base Repair and Renovation/Addition are longer in duration due to limitations associated with working in an occupied building. The Doherty Site requires phased adjacent occupied construction, on a tighter site, that is taken account in the estimates. The Foley site construction would require pile foundations and relocation of the Beaver Brook conduit, which is taken into account.
- It should be noted the number of developable athletic fields with each scheme varies; therefore, the site costs are not equal. None of the available sites under study can provide the required programmed fields. For the City's capital planning benefit, offsite improvements for Sports fields were developed and budgeted. It is recognized that MSBA reimbursement is not anticipated since the potential added fields would be used by Doherty High school, as well as other Schools and the Community.
- Additionally, each Doherty scheme requires that the existing site practice fields and parking will have to be relocated, prior to the new construction. For all options, other costs such as land costs, off site fields and swing space requirements are considered. These are outlined in the site option review section. Schemes and budgets were developed to accommodate the required relocations unique to each site and are published, to be used by the City for their consideration when selecting the preferred site and scheme.
- Note that the budgets developed under the PSR, are consistent with the budgets presented in the PDP.
- Note that the Doherty Scheme in the PDP, included an under-field parking garage. This was not seen as advantageous due to resultant field restrictions. Additionally, estimates showed that a building parking garage would be less expensive than an under-field garage. The garage location became an important consideration as the Doherty options were developed.
- **It should be emphasized that comparative budgets are for construction only and exclude other project costs** (i.e. Designer and OPM fees, escalation of non-construction items, legal fees, Owner's project contingency, furnishings/fixtures/equipment, technology/computer equipment, surveys, construction testing, printing, etc.) which commonly is seen as 25%, is added to the construction cost.
- The developed schemes were also budgeted by the Owners project managers estimating department, and were reviewed with considerations for the published budget.
- Total Project Budget (TPB) costs were established by the OPM.

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ptim@amfogarty.com
"Construction Cost Consultants"

Doherty High School
Worcester, MA

December 5, 2018

GRAND SUMMARY

Chptr 149 a CM @ Risk:

A.1 NEW CONSTRUCTION - DOHERTY SITE: PODS ON PARK	$235,060,334
A.2 NEW CONSTRUCTION - DOHERTY SITE: OLMSTEAD HOMAGE	$236,035,323
A.3 NEW CONSTRUCTION - HIGHLAND PROUD	$250,052,697
B.1 NEW CONSTRUCTION FOLEY SITE	$229,745,472
C.2 NEW CONSTRUCTION CHANDLER + LAND	$214,107,806
RENOVATION ADDITION	$222,438,660
CODE UPGRADE	$82,378,357

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ptim@amfogarty.com
"Construction Cost Consultants"

PSR
Doherty High School
Worcester, MA

5-Dec-18

Designer: Lamoureux Pagano Architects

A.1 NEW CONSTRUCTION - DOHERTY SITE: PODS ON PARK

	GSF		COST PER S.F.	**TOTAL**
NEW CONSTRUCTION	420,000	GSF	$332.16	$139,505,557
DEMOLITION	167,000	GSF	$8.00	$1,336,000
HAZARDOUS WASTE REMOVAL				$2,459,750
PARKING GARAGE w/in BLDG	58,845	GSF	$99.69	$5,866,200
SITE COST				$20,174,248

TOTAL DIRECT COST				$169,341,755
CM AT RISK CHPTR 149A				
DESIGN CONTINGENCY		15%		$25,401,263
CM CONTINGENCY		3.0%		$5,842,291
ESCALATION (bid winter 2021)		5.0%		$9,737,151
GENERAL CONDITIONS	46	MOS	$150,000	$6,900,000
GENERAL REQUIREMENTS		3%		$6,516,674
BUILDING PERMIT		0%		$0
P&P BOND & INSURANCE		2%		$4,474,783
PROFIT		3%		$6,846,417

TOTAL CONSTRUCTION COST				$235,060,334
COST PER SF				**$559.67**

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"Construction Cost Consultants"

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Doherty High School
Worcester, MA

5-Dec-18

Designer: Lamoureux Pagano Architects

A.2 NEW CONSTRUCTION - DOHERTY SITE: OLMSTEAD HOMAGE

	GSF		COST PER S.F.	**TOTAL**
NEW CONSTRUCTION	420,000	GSF	$315.48	$132,499,899
DEMOLITION	167,000	GSF	$8.00	$1,336,000
HAZARDOUS WASTE REMOVAL				$2,459,750
PARKING GARAGE w/in building	58,845	GSF	$99.69	$5,866,200
SITE COST				$27,905,350

TOTAL DIRECT COST				$170,067,198
CM AT RISK CHPTR 149A				
DESIGN CONTINGENCY		15%		$25,510,080
CM CONTINGENCY		3.0%		$5,867,318
ESCALATION (bid winter 2021)		5.0%		$9,778,864
GENERAL CONDITIONS	46	MOS	$150,000	$6,900,000
GENERAL REQUIREMENTS		3%		$6,543,704
BUILDING PERMIT		0%		$0
P&P BOND & INSURANCE		2%		$4,493,343
PROFIT		3%		$6,874,815

TOTAL CONSTRUCTION COST				$236,035,323
COST PER SF				**$561.99**

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A.3 NEW CONSTRUCTION - HIGHLAND PROUD

	GSF		COST PER S.F.	**TOTAL**
NEW CONSTRUCTION	420,000	GSF	$322.12	$135,289,240
DEMOLITION	167,000	GSF	$8.00	$1,336,000
HAZARDOUS WASTE REMOVAL				$2,459,750
PARKING GARAGE Under the sports field	95,000	GSF	$140.86	$13,381,800
SITE COST				$28,754,713

	TOTAL DIRECT COST			$181,221,503
CM AT RISK CHPTR 149A				
DESIGN CONTINGENCY		15%		$27,183,225
CM CONTINGENCY		3.0%		$6,252,142
ESCALATION (bid winter 2021)		5.0%		$10,420,236
GENERAL CONDITIONS	40	MOS	$150,000	$6,000,000
GENERAL REQUIREMENTS		3%		$6,932,313
BUILDING PERMIT		0%		$0
P&P BOND & INSURANCE		2%		$4,760,188
PROFIT		3%		$7,283,088

	TOTAL CONSTRUCTION COST			$250,052,697
		COST PER SF		**$595.36**

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B.1 NEW CONSTRUCTION FOLEY SITE

	GSF		COST PER S.F.	**TOTAL**
NEW CONSTRUCTION	420,000	GSF	$342.99	$144,056,395
DEMOLITION		SEE SITEWORK		
HAZARDOUS WASTE REMOVAL				$95,000
PARKING GARAGE			deleted	
SITE COST				$21,960,459

	TOTAL DIRECT COST			$166,111,854
CM AT RISK CHPTR 149A				
DESIGN CONTINGENCY		15%		$24,916,778
CM CONTINGENCY		3.0%		$5,730,859
ESCALATION (bid winter 2021)		5.0%		$9,551,432
GENERAL CONDITIONS	40	MOS	$150,000	$6,000,000
GENERAL REQUIREMENTS		3%		$6,369,328
BUILDING PERMIT		0%		$0
P&P BOND & INSURANCE		2%		$4,373,605
PROFIT		3%		$6,691,616

	TOTAL CONSTRUCTION COST			$229,745,472
		COST PER SF		**$547.01**

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C.2 NEW CONSTRUCTION CHANDLER + LAND

	GSF		COST PER S.F.	**TOTAL**
NEW CONSTRUCTION	420,000	GSF	$317.65	$133,413,267
DEMOLITION	85,973	GSF	$8.00	$687,784
HAZARDOUS WASTE REMOVAL				$725,000
SITE COST				$20,133,646

TOTAL DIRECT COST				$154,959,697
CM AT RISK CHPTR 149A				
DESIGN CONTINGENCY		15%		$23,243,955
CM CONTINGENCY		3.0%		$5,346,110
ESCALATION (bid winter 2021)		5.0%		$8,910,183
GENERAL CONDITIONS	36	MOS	$150,000	$5,400,000
GENERAL REQUIREMENTS		3%		$5,935,798
BUILDING PERMIT		0%		$0
P&P BOND & INSURANCE		2%		$4,075,915
PROFIT		3%		$6,236,150

TOTAL CONSTRUCTION COST				$214,107,806
COST PER SF				**$509.78**

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RENOVATION ADDITION

	GSF		COST PER S.F.	TOTAL
ADDITION	322,000	GSF	$330.00	$106,260,000
RENOVATION	98,000	GSF	$200.00	$19,600,000
DEMOLITION	77,500	GSF	$8.00	$620,000
HAZARDOUS WASTE REMOVAL				$2,809,750
RENOVATION PCB PREMIUM				$1,200,000
TEMPORARY CLASSROOM				$8,000,000
PARKING GARAGE	95,000	GSF	$140.86	$13,381,800
SITE COST				$7,837,467

TOTAL DIRECT COST				$159,709,017
CM AT RISK CHPTR 149A				
DESIGN CONTINGENCY		15%		$23,956,353
CM CONTINGENCY		3.0%		$5,509,961
ESCALATION (bid winter 2021)		5.0%		$9,183,268
GENERAL CONDITIONS	48	MOS	$150,000	$7,200,000
GENERAL REQUIREMENTS		3%		$6,166,758
BUILDING PERMIT		0%		$0
P&P BOND & INSURANCE		2%		$4,234,507
PROFIT		3%		$6,478,796

TOTAL CONSTRUCTION COST				$222,438,660
COST PER SF				**$529.62**

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CODE UPGRADE

	GSF		COST PER S.F.	**TOTAL**
RENOVATION	167,000	GSF	$211.00	$35,237,000
MODULAR UNITS	30,000	GSF	$375.00	$11,250,000
HAZARDOUS WASTE REMOVAL				$2,809,750
RENOVATION PCB PREMIUM				$1,200,000
SITE COST				$5,000,000

	TOTAL DIRECT COST			$55,496,750
CM AT RISK CHPTR 149A				
DESIGN CONTINGENCY		15%		$8,324,513
CM CONTINGENCY		3.0%		$1,914,638
ESCALATION (bid winter 2021)		5.0%		$3,191,063
GENERAL CONDITIONS	48	MOS	$150,000	$7,200,000
GENERAL REQUIREMENTS		3%		$2,283,809
BUILDING PERMIT		0%		$0
P&P BOND & INSURANCE		2%		$1,568,215
PROFIT		3%		$2,399,370

	TOTAL CONSTRUCTION COST			$82,378,357
		COST PER SF		**$493.28**

Prepared by: A. M. Fogarty & Associates, Inc.

PROJECT: Doherty High School
LOCATION: Worcester, MA
CLIENT: Lamoureux Pagano Architects
DATE: 05-Dec-18

SUMMARY

	OPT A1 RENOVATION TOTAL	OPT A2 ESTIMATE TOTAL	OPT A3 ESTIMATE TOTAL	OPT B1 ESTIMATE TOTAL	OPT C2 ADDITION TOTAL
A. SUBSTRUCTURE					
A10 - FOUNDATIONS					
A1010 STANDARD FOUNDATIONS	$4,901,068	$3,778,684	$4,306,047	$9,123,776	$4,175,532
A1030 SLAB ON GRADE	$2,392,362	$1,877,470	$2,141,898	$2,496,706	$2,637,790
B. SHELL					
B10 - SUPERSTRUCTURE					
B1010 FLOOR CONSTRUCTION	$11,785,070	$12,954,750	$12,350,250	$11,544,250	$11,221,300
B1020 ROOF CONSTRUCTION	$4,809,200	$3,907,700	$4,418,550	$5,019,550	$5,251,950
B20 - EXTERIOR ENCLOSURE					
B2010 EXTERIOR WALLS	$10,234,789	$7,616,877	$8,592,577	$10,234,789	$7,616,877
B2020 EXTERIOR WINDOWS	$7,784,750	$5,819,750	$6,466,100	$7,784,750	$7,784,750
B2030 EXTERIOR DOORS	$247,750	$247,750	$247,750	$247,750	$247,750
B30 - ROOFING					
B3010 ROOF COVERINGS	$3,694,250	$2,972,750	$3,380,400	$3,694,250	$4,031,000
B3020 ROOF OPENINGS	$944,750	$612,600	$822,600	$944,750	$944,750
C. INTERIORS					
C10 - INTERIOR CONSTRUCTION					
C1010 PARTITIONS	$10,983,818	$10,983,818	$10,983,818	$10,353,818	$10,353,818
C1020 INTERIOR DOORS	$3,239,100	$3,239,100	$3,239,100	$3,239,100	$3,239,100
C1030 FITTINGS	$3,932,650	$3,932,650	$3,784,150	$3,932,650	$3,932,650
C20 - STAIRS					
C2010 STAIR CONSTRUCTION	$1,184,500	$1,184,500	$1,184,500	$1,184,500	$1,184,500
C2020 STAIR FINISHES	$147,900	$147,900	$147,900	$147,900	$147,900
C30 - INTERIOR FINISHES					
C3010 WALL FINISHES	$3,565,250	$3,565,250	$3,565,250	$3,565,250	$3,565,250
C3020 FLOOR FINISHES	$5,460,000	$5,460,000	$5,460,000	$5,460,000	$5,460,000
C3030 CEILING FINISHES	$4,200,000	$4,200,000	$4,200,000	$4,200,000	$4,200,000
D. SERVICES					
D10 - CONVEYING					
D1010 ELEVATORS & LIFTS	$614,700	$614,700	$614,700	$554,700	$554,700
D20 - PLUMBING					
D2010 PLUMBING	$7,770,000	$7,770,000	$7,770,000	$7,560,000	$7,560,000
D30 - HVAC					
D3010 HVAC	$21,840,000	$21,840,000	$21,840,000	$21,000,000	$21,000,000
D40 - FIRE PROTECTION					
D4010 SPRINKLERS	$2,693,000	$2,693,000	$2,693,000	$2,273,000	$2,273,000
D50 - ELECTRICAL					
D5010 ELECTRICAL SERVICE & DISTRIBUTION	$3,400,000	$3,400,000	$3,400,000	$2,350,000	$2,350,000
D5020 LIGHTING & BRANCH WIRING	$4,410,000	$4,410,000	$4,410,000	$4,410,000	$4,410,000

D5030 COMMUNICATION & SECURITY	$6,090,000	$6,090,000	$6,090,000	$6,090,000	$6,090,000
D5090 OTHER ELECTRICAL SYSTEMS	$6,258,000	$6,258,000	$6,258,000	$6,258,000	$6,258,000

Doherty High School - PSR Estimate NEW CONSTRUCTION	OPT A1 RENOVATION TOTAL	OPT A2 ESTIMATE TOTAL	OPT A3 ESTIMATE TOTAL	OPT B1 ESTIMATE TOTAL	OPT C2 ADDITION TOTAL
E. EQUIPMENT & FURNISHINGS					
E10 - EQUIPMENT					
E1010 COMMERCIAL EQUIPMENT	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000
E1020 INSTITUTIONAL EQUIPMENT	$0	$0	$0	$0	$0
E1030 VEHICULAR EQUIPMENT	$0	$0	$0	$0	$0
E1090 OTHER EQUIPMENT	$1,937,650	$1,937,650	$1,937,650	$1,937,650	$1,937,650
E20 - FURNISHINGS					
E 2010 FIXED FURNISHINGS	$3,735,000	$3,735,000	$3,735,000	$3,735,000	$3,735,000
E2020 MOVABLE FURNISHINGS	$0	$0	$0	$0	$0
F. SPECIAL CONSTRUCTION & DEMOLITION					
F20 - SELECTIVE BUILDING DEMOLITION					
F2010 BUILDING ELEMENTS DEMOLITION	$0	$0	$0	$644,256	$0
F2020 HAZARDOUS COMPONENTS ABATEMENT	$0	$0	$0	$0	$0
G. BUILDING SITEWORK					
G10 - SITE PREPARATION					
G1010 SITE CLEARING	$1,227,881	$1,227,881	$1,227,881	$985,950	$1,082,706
G1020 SITE DEMOLITION & RELOCATIONS	$804,947	$804,947	$804,947	$630,000	$698,873
G1030 SITE EARTHWORK	$9,094,313	$16,649,313	$17,379,313	$7,588,100	$6,238,100
G1040 HAZARDOUS WASTE REMEDIATION	$0	$0	$0	$0	$0
G20 - SITE IMPROVEMENTS					
G2010 ROADWAYS	$1,136,184	$1,017,295	$1,135,348	$1,540,505	$1,216,884
G2020 PARKING LOTS	$0	$0	$0	$0	$0
G2030 PEDESTRIAN PAVING	$401,750	$401,750	$416,700	$547,830	$547,830
G2040 SITE DEVELOPMENT	$3,759,864	$4,037,364	$4,037,364	$4,037,364	$5,968,284
G2050 LANDSCAPING	$942,900	$960,390	$946,750	$946,750	$695,510
G30 - SITE MECHANICAL UTILITIES					
G3010 WATER SUPPLY	$275,560	$275,560	$275,560	$275,560	$275,560
G3020 SANITARY SEWER	$126,000	$126,000	$126,000	$126,000	$126,000
G3030 STORM SEWER	$1,709,100	$1,709,100	$1,709,100	$4,516,100	$2,542,600
G3040 HEATING DISTRIBUTION	$0	$0	$0	$0	$0
G3050 COOLING DISTRIBUTION	$0	$0	$0	$0	$0
G3060 FUEL DISTRIBUTION	$24,000	$24,000	$24,000	$24,000	$24,000
G3090 OTHER SITE MECHANICAL UTILITIES	$0	$0	$0	$0	$0
G40 - SITE ELECTRICAL UTILITIES					
G4010 ELECTRICAL DISTRIBUTION	$304,500	$304,500	$304,500	$304,500	$279,500
G4020 SITE LIGHTING	$367,250	$367,250	$367,250	$437,800	$437,800
	---------	---------	---------	---------	---------
TOTAL DIRECT COST	$159,679,805	$160,405,248	$164,043,953	###########	$153,546,913

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
A. SUBSTRUCTURE												
A10 - FOUNDATIONS												
A1010 STANDARD FOUNDATIONS												
033000 CAST IN PLACE CONCRETE												
Column Footing	$440.00	CY	1,300	572,000	1,000	440,000	1,150	$506,000	1,450	638,000	1,500	660,000
Wall Footing	$410.00	CY	372	152,520	330	135,300	360	$147,600	372	152,520	300	123,000
Basement Wall	$1,050.00	CY	790	829,500	563	591,150	836	$877,800	790	829,500	375	393,750
Frost wall	$985.00	CY	474	466,890	320	315,200	362	$356,570	510	502,350	400	394,000
Interior Foundation	$1,025.00	CY	300	307,500	200	205,000	200	$205,000	300	307,500	200	205,000
Grade Beam	$1,100.00	CY	400	440,000	140	154,000	140	$154,000	400	440,000	350	385,000
Loading Dock	$875.00	CY	40	35,000	40	35,000	40	$35,000	40	35,000	40	35,000
Piers and Pilaster	$1,100.00	CY	250	275,000	200	220,000	225	$247,500	250	275,000	200	220,000
Elev Pits	$875.00	CY	20	17,500	20	17,500	20	$17,500	20	17,500	20	17,500
Setting Anchor Bolts and Grout	$310.00	EA	875	271,250	790	244,900	790	$244,900	875	271,250	890	275,900
Premium for Grade beam and pile c	$10.00	SF							141,000	1,410,000		
072100 INSULATION												
2" Rigid found. insul - ret. wall	$3.45	SF	15,152	52,274	11,408	39,358	16,928	$58,402	15,152	52,274	7,408	25,558
2" Rigid found. insul - frost wall	$3.45	SF	9,604	33,134	6,480	22,356	7,324	$25,268	9,604	33,134	7,920	27,324
071000 DAMPPROOF., WATERPROOF. & CAULKING*												
Foundation waterproof	$7.50	SF	15,152	113,640	11,408	85,560	16,928	$126,960	15,152	113,640	7,408	55,560
Foundation dampproofing	$2.00	SF	9,604	19,208	6,480	12,960	7,324	$14,648	9,604	19,208	7,920	15,840
Elev. pit waterproofing	$4,500.00	LS	2	9,000	2	9,000	2	$9,000	2	9,000	2	9,000
310000 EARTHWORK												
Foundation Earthwork:												
Foundation excavation /backfill	$2.50	GSF	420,000	1,050,000	420,000	1,050,000	420,000	$1,050,000	420,000	1,050,000	420,000	1,050,000
Coal ash disposal	$100.00	CY							27,000	2,700,000		
*bldg cut carried w/ sitework												
Radon Mitigation	$0.70	SF	135,080	94,556	106,000	74,200	121,000	$84,700	141,000	98,700	149,000	104,300

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
Underslab Draiange	$1.20	SF	135,080	162,096	106,000	127,200	121,000	$145,200	141,000	169,200	149,000	178,800
				---------- $4,901,068		---------- $3,778,684		---------- $4,306,047		---------- $9,123,776		---------- $4,175,532
A1020 SPECIAL FOUNDATIONS												
Piles or Caissons	$20.00	SF							141,000	2,820,000		
				---------- $0		---------- $0		---------- $0		---------- $2,820,000		---------- $0
A1030 SLAB ON GRADE												
<u>310000 EARTHWORK</u>												
12" Gravel base	$38.00	CY	5,003	190,114	3,925	149,150	4,481	$170,278	5,222	198,436	5,520	209,760
Excavate plumbing trenches	$0.65	SF	135,080	87,802	106,000	68,900	121,000	$78,650	141,000	91,650	149,000	96,850
Under slab drainage	$1.35	SF	135,080	182,358	106,000	143,100	121,000	$163,350	141,000	190,350	149,000	201,150
<u>033000 CAST IN PLACE CONCRETE</u>												
5" Slab on Grade	$9.65	SF	135,080	1,303,522	106,000	1,022,900	121,000	$1,167,650	141,000	1,360,650	149,000	1,437,850
Thicken slab @ cols & CMU	$225.00	CY	50	11,250	40	9,000	40	$9,000	50	11,250	50	11,250
RENOVATION:												
Patch slab at plumbing	$75,000.00	LS										
<u>072100 INSULATION</u>												
2" Rigid Slab Insul. - 100%	$3.65	SF	135,080	493,042	106,000	386,900	121,000	$441,650	141,000	514,650	149,000	543,850
<u>072616 BELOW GRADE VAPOR RETARDER</u>												
Stegro vapor barrier	$0.92	SF	135,080	124,274	106,000	97,520	121,000	$111,320	141,000	129,720	149,000	137,080
				---------- $2,392,362		---------- $1,877,470		---------- $2,141,898		---------- $2,496,706		---------- $2,637,790
TOTAL A10 FOUNDATIONS				**$7,293,430**		**$5,656,154**		**$6,447,945**		**$14,440,482**		**$6,813,322**

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
B. SHELL												
B10 - SUPERSTRUCTURE												
B1010 FLOOR CONSTRUCTION												
051200 STRUCTURAL STEEL												
Floor frame (13 lbs / SF)	$4,000.00	TONS	1851.98	7,407,920	2041.00	8,164,000	1943.50	$7,774,000	1813.50	$7,254,000	1761.50	7,046,000
Shear stud (10/100 SF)	$5.50	EA	29,000	159,500	31,500	173,250	30,000	$165,000	28,000	$154,000	27,100	149,050
Frame at New Exterior Wall	$60,000.00	LS										
033000 CAST IN PLACE CONCRETE												
4 1/2" NW Deck fill	$7.25	SF	284,920	2,065,670	314,000	2,276,500	299,000	$2,167,750	279,000	$2,022,750	271,000	1,964,750
053100 STEEL DECKING												
2" x 20 Ga. comp deck	$3.30	SF	284,920	940,236	314,000	1,036,200	299,000	$986,700	279,000	$920,700	271,000	894,300
072100 INSULATION												
Spray on fireproofing - 2 HR	$3.20	SF	284,920	911,744	314,000	1,004,800	299,000	$956,800	279,000	$892,800	271,000	867,200
Intumescent coatings	$300,000.00	LS	1	300,000	1	300,000	1	$300,000	1	$300,000	1	300,000
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				$11,785,070		$12,954,750		$12,350,250		$11,544,250		$11,221,300
B1020 ROOF CONSTRUCTION												
051200 STRUCTURAL STEEL												
Typ. flat roof frame (13 lbs / SF)	$4,000.00	TONS	942.50	3,770,000	747.50	2,990,000	858.00	$3,432,000	988.00	$3,952,000	1,040.00	4,160,000
Galv. RTU dunnage - allow	$4,250.00	TONS	20	85,000	20	85,000	20	$85,000	20	$85,000	20	85,000
8' Galv. TS roof screen support	$4,250.00	TONS	15	63,750	15	63,750	15	$63,750	15	$63,750	15	63,750
Frame Entry Canopies	$4,500.00	TONS	10	45,000	10	45,000	10	$45,000	10	$45,000	10	45,000
033000 CAST IN PLACE CONCRETE												
3 1/2" NWConc. Deck fill - mech	$6.75	SF	10,000	67,500	10,000	67,500	10,000	$67,500	10,000	$67,500	10,000	67,500

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
053100 STEEL DECKING												
3" x 18 Ga acoust. deck - gym/musi	$7.95	SF	38,000	302,100	38,000	302,100	38,000	$302,100	38,000	$302,100	38,000	302,100
1 1/2" x 20 Ga balance flat roof de	$3.05	SF	107,000	326,350	77,000	234,850	94,000	$286,700	114,000	$347,700	122,000	372,100
1 1/2" x 20 Ga canopy roof deck	$3.00	SF	1,500	4,500	1,500	4,500	1,500	$4,500	1,500	$4,500	1,500	4,500
072100 INSULATION												
Spray on fireproofing - 2 HR	$1.00	SF	145,000	145,000	115,000	115,000	132,000	$132,000	152,000	$152,000	152,000	152,000
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				$4,809,200		$3,907,700		$4,418,550		$5,019,550		$5,251,950
TOTAL B10 SUPERSTRUCTURE				**$16,594,270**		**$16,862,450**		**$16,768,800**		**$16,563,800**		**$16,473,250**
B20 - EXTERIOR ENCLOSURE												
B2010 EXTERIOR WALLS												
040001 MASONRY*												
8" CMU backup - gym/kitchen/mec	$25.50	SF	4,000	102,000	4,000	102,000	4,000	$102,000	4,000	$102,000	4,000	102,000
Masonry Veneer:												
Brick Veneer - 40% of area	$36.00	SF	60,000	2,160,000	44,400	1,598,400	49,000	$1,764,000	60,000	$2,160,000	44,400	1,598,400
Precast window lintel	$75.00	LF	5,300	397,500	3,800	285,000	4,400	$330,000	5,300	$397,500	3,800	285,000
Precast window sill - typ.	$48.00	LF	5,000	240,000	3,664	175,872	4,100	$196,800	5,000	$240,000	3,664	175,872
Precast gym window sill	$60.00	LF	350	21,000	350	21,000	350	$21,000	350	$21,000	350	21,000
Canopy col. -complete	$4,500.00	EA	20	90,000	20	90,000	20	$90,000	20	$90,000	20	90,000
Precast trim allowance	$2.00	GSF	150,012	300,024	111,000	222,000	121,000	$242,000	150,012	$300,024	111,000	222,000
Masonry flashing	$50,000.00	LS	1	50,000	1	50,000	1	$50,000	1	$50,000	1	50,000
054000 COLD FORMED METAL FRAMING												
3" Soffit/eave framing	$10.00	SF	14,000	140,000	9,500	95,000	12,000	$120,000	14,000	$140,000	9,500	95,000
3" Canopy ceiling framing	$7.00	SF	1,500	10,500	1,500	10,500	1,500	$10,500	1,500	$10,500	1,500	10,500
1/2" Dens glass sheathing -soffit	$3.50	SF	14,000	49,000	9,500	33,250	12,000	$42,000	14,000	$49,000	9,500	33,250
1/2" Dens glass sheathing -ceiling	$3.50	SF	1,500	5,250	1,500	5,250	1,500	$5,250	1,500	$5,250	1,500	5,250
6" x 18 Ga. stud @ typical wall	$9.50	SF	90,000	855,000	66,600	632,700	72,780	$691,410	90,000	$855,000	66,600	632,700

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
1/2" Dens glass sheathing-ext. wall	$3.50	SF	104,000	364,000	76,100	266,350	84,780	$296,730	104,000	$364,000	76,100	266,350
050001 MISCELLANEOUS & ORNAMENTAL IRON*												
Galv, loose lintel	$36.00	LF	5,300	190,800	3,800	136,800	4,400	$158,400	5,300	$190,800	3,800	136,800
*Relieving angle carried w/Structure												
071326 AIR & VAPOR BARRIERS												
Adhered air & vapor barrier - wall	$8.00	SF	90,000	720,000	66,600	532,800	78,780	$630,240	90,000	$720,000	66,600	532,800
Adhered air & vapor barrier - soffit	$8.00	SF	14,000	112,000	9,500	76,000	12,000	$96,000	14,000	$112,000	9,500	76,000
072100 INSULATION												
Spray foam at perm openings	$6.80	LF	25,000	170,000	19,000	129,200	21,000	$142,800	25,000	$170,000	19,000	129,200
4" Rock wool Insul - wall	$4.40	SF	90,000	396,000	66,600	293,040	72,780	$320,232	90,000	$396,000	66,600	293,040
074213 PERFORMED CLADDING												
Wall Panel:												
Composite wall panel - 20% area	$75.00	SF	30,000	2,250,000	22,000	1,650,000	24,620	$1,846,500	30,000	$2,250,000	22,000	1,650,000
Composite wall panel - cornice/eave	$75.00	SF	14,000	1,050,000	9,500	712,500	12,000	$900,000	14,000	$1,050,000	9,500	712,500
8' Equip roof screen (500LF) - allow	$60.00	SF	4,000	240,000	4,000	240,000	4,000	$240,000	4,000	$240,000	4,000	240,000
Canopy ceiling	$35.00	SF	1,500	52,500	1,500	52,500	1,500	$52,500	1,500	$52,500	1,500	52,500
092116 GYPSUM WALLBOARD												
1 Lyr 5/8" gyp @ ext. wall	$2.50	SF	85,000	212,500	60,000	150,000	75,000	$187,500	85,000	$212,500	60,000	150,000
090007 PAINTING*												
Exterior painting	$25,000.00	LS	1	25,000	1	25,000	1	$25,000	1	$25,000	1	25,000
101400 IDENTIFYING DEVICES (EXT. BLD MTD SIGNAGE)												
24" Alum bldg mtd letter - allow	$395.00	EA	17	6,715	17	6,715	17	$6,715	17	$6,715	17	6,715
Exterior Signage	$25,000.00	EA	1	25,000	1	25,000	1	$25,000	1	$25,000	1	25,000

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
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				$10,234,789		$7,616,877		$8,592,577		$10,234,789		$7,616,877
B2020 EXTERIOR WINDOWS												
061000 ROUGH CARPENTRY												
P.T. - perim blocking	$4.50	LF	25,000	112,500	19,000	85,500	21,000	$94,500	25,000	$112,500	25,000	112,500
071326 AIR & VAPOR BARRIERS												
Flex flashing - perim	$8.00	LF	25,000	200,000	19,000	152,000	21,000	$168,000	25,000	$200,000	25,000	200,000
071000 DAMPPROOF., WATERPROOF. & CAULKING*												
Exterior sealants - perim.	$7.50	LF	25,000	187,500	19,000	142,500	21,000	$157,500	25,000	$187,500	25,000	187,500
Masonry Control Joints	$12.50	LF	1,500	18,750	1,100	13,750	1,400	$17,500	1,500	$18,750	1,500	18,750
080001 METAL WINDOWS*												
Curtain wall - 7" - 20%	$130.00	SF	30,000	3,900,000	22,000	2,860,000	24,620	$3,200,600	30,000	$3,900,000	30,000	3,900,000
Sun screen (30") - allow	$350,000.00	LS	1	350,000	1	350,000	1	$350,000	1	$350,000	1	350,000
Alum Window - dbl glazed - 20% e	$100.00	SF	30,000	3,000,000	22,000	2,200,000	24,620	$2,462,000	30,000	$3,000,000	30,000	3,000,000
109000 MISCELLANEOUS SPECIALTIES												
Alum louvers - allow	$80.00	SF	200	16,000	200	16,000	200	$16,000	200	$16,000	200	16,000
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				$7,784,750		$5,819,750		$6,466,100		$7,784,750		$7,784,750
B2030 EXTERIOR DOORS												
061000 ROUGH CARPENTRY												
P.T. - perim blocking - HM open	$4.50	LF	150	675	150	675	150	$675	150	$675	150	675
071000 DAMPPROOF., WATERPROOF. & CAULKING*												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
Exterior sealants - perim. HM open	$7.50	LF	150	1,125	150	1,125	150	$1,125	150	$1,125	150	1,125
080001 METAL WINDOWS*												
7' Alum. Doors (Incl. Hardware):												
Entry - dbl	$9,000.00	EA	8	72,000	8	72,000	8	$72,000	8	$72,000	8	72,000
Entry - sgl	$4,500.00	EA	8	36,000	8	36,000	8	$36,000	8	$36,000	8	36,000
Café - dbl	$9,000.00	EA	2	18,000	2	18,000	2	$18,000	2	$18,000	2	18,000
Roof access - sgl	$2,750.00	EA	2	5,500	2	5,500	2	$5,500	2	$5,500	2	5,500
Auto opener - allow	$8,000.00	PR	1	8,000	1	8,000	1	$8,000	1	$8,000	1	8,000
Classroom - sgl		N/A										
*Storefront at entries W /B 2020												
081113 HOLLOW METALWORK												
Insulated HM Doors and Frame:												
Receiving - dbl	$2,950.00	EA	1	2,950	1	2,950	1	$2,950	1	$2,950	1	2,950
Elec/mech rm - sgl	$1,500.00	EA	1	1,500	1	1,500	1	$1,500	1	$1,500	1	1,500
Elec/mech rm - dbl	$3,000.00	EA	1	3,000	1	3,000	1	$3,000	1	$3,000	1	3,000
Storage - dbl	$3,000.00	EA	1	3,000	1	3,000	1	$3,000	1	$3,000	1	3,000
Gym - dbl	$5,500.00	EA	2	11,000	2	11,000	2	$11,000	2	$11,000	2	11,000
083323 SPECIAL DOORS												
Specialty Door	$75,000.00	EA	1	75,000	1	75,000	1	$75,000	1	$75,000	1	75,000
OH Door receiving	$10,000.00	EA	1	10,000	1	10,000	1	$10,000	1	$10,000	1	10,000
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				$247,750		$247,750		$247,750		$247,750		$247,750
TOTAL B20 - EXTERIOR ENCLOSURE				**$18,267,289**		**$13,684,377**		**$15,306,427**		**$18,267,289**		**$15,649,377**
B30 - ROOFING												
B3010 ROOF COVERINGS												
061000 ROUGH CARPENTRY												
Roof Blocking	$1.50	SF	145,000	217,500	115,000	172,500	132,000	$198,000	145,000	$217,500	160,000	240,000
070002 ROOFING AND FLASHING*												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
PVC roof - canopy	$12.00	SF	1,500	18,000	1,500	18,000	1,500	$18,000	1,500	$18,000	1,500	18,000
PVC roof w/ 6" rigid insul	$18.00	SF	145,000	2,610,000	115,000	2,070,000	132,000	$2,376,000	145,000	$2,610,000	160,000	2,880,000
1/2" Gyp prot. bd w/glass mat @ P	$2.00	SF	145,000	290,000	115,000	230,000	132,000	$264,000	145,000	$290,000	160,000	320,000
Poly vapor barrier - 100%	$0.45	SF	145,000	65,250	115,000	51,750	132,000	$59,400	145,000	$65,250	160,000	72,000
Flashing	$1.50	SF	145,000	217,500	115,000	172,500	132,000	$198,000	145,000	$217,500	160,000	240,000
Roof walkway paver (2'x2')	$26.00	EA	3,500	91,000	3,500	91,000	3,500	$91,000	3,500	$91,000	3,500	91,000
Alum.Trim :												
Typical wall coping	$30.00	SF	4,500	135,000	3,900	117,000	4,200	$126,000	4,500	$135,000	4,000	120,000
Misc. flashing	$50,000.00	LS	1	50,000	1	50,000	1	$50,000	1	$50,000	1	50,000
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				$3,694,250		$2,972,750		$3,380,400		$3,694,250		$4,031,000
B3020 ROOF OPENINGS												
<u>077200 ROOF ACCESSORIES</u>												
Roof hatch	$4,200.00	EA	3	12,600	3	12,600	3	$12,600	3	$12,600	3	12,600
Elevator vent	$1,500.00	EA	2	3,000	2	3,000	2	$3,000	2	$3,000	2	3,000
Roof guardrail	$140.00	LF	200	28,000	200	28,000	200	$28,000	200	$28,000	200	28,000
Stage vent	$11,000.00	EA	4	44,000	4	44,000	4	$44,000	4	$44,000	4	44,000
Skylights	$175.00	SF	4,898	857,150	3,000	525,000	4,200	$735,000	4,898	$857,150	4,898	857,150
*Mechanical equip screen is included with B1020 & B2010												
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				$944,750		$612,600		$822,600		$944,750		$944,750
TOTAL B30 ROOFING				**$4,639,000**		**$3,585,350**		**$4,203,000**		**$4,639,000**		**$4,975,750**
<u>C. INTERIORS</u>												
C10 - INTERIOR CONSTRUCTION												
C1010 PARTITIONS												
<u>040001 MASONRY*</u>												
8" CMU elev. shaft wall	$33.00	SF	3,381	111,573	3,381	111,573	3,381	$111,573	3,381	$111,573	3,381	111,573
8" CMU - Gym/ Mech	$28.50	SF	8,900	253,650	8,900	253,650	8,900	$253,650	8,900	$253,650	8,900	253,650
<u>050001 MISCELLANEOUS & ORNAMENTAL IRON*</u>												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
CMU angle brace frame - 4' 0C	$75.00	EA	425	31,875	425	31,875	425	$31,875	425	$31,875	425	31,875
Loose lintels	$30,000.00	LS	1	30,000	1	30,000	1	$30,000	1	$30,000	1	30,000
Expansion joints Assembly	$75,000.00	LS	1	75,000	1	75,000	1	$75,000	1	$75,000	1	75,000
061000 ROUGH CARPENTRY												
Interior blocking	$0.30	GSF	420,000	126,000	420,000	126,000	420,000	$126,000	420,000	$126,000	420,000	126,000
Misc. rough carpentry	$0.50	GSF	420,000	210,000	420,000	210,000	420,000	$210,000	420,000	$210,000	420,000	210,000
072100 INSULATION												
Firestopping	$0.85	GSF	420,000	357,000	420,000	357,000	420,000	$357,000	420,000	$357,000	420,000	357,000
081113 HOLLOW METALWORK												
Interior H.M Windows, Sidelites and Transoms (INC. GLAZING):												
Sidelight, Transom and Borrow Lig	$80.00	SF	6,000	480,000	6,000	480,000	6,000	$480,000	6,000	$480,000	6,000	480,000
083323 SPECIAL DOORS												
Access panels	$50,000.00	LS	1	50,000	1	50,000	1	$50,000	1	$50,000	1	50,000
090007 PAINTING*												
Paint window/sidelight & transom	$5.00		6,000	30,000	6,000	30,000	6,000	$30,000	6,000	$30,000	6,000	30,000
092116 GYPSUM WALLBOARD												
Specialty Partitions:												
Operable Classroom partition (6 to	$115.00	SF	1,728	198,720	1,728	198,720	1,728	$198,720	1,728	$198,720	1,728	198,720
Drywall Partitions:												
GWB assemblies	$20.00	GSF	420,000	8,400,000	420,000	8,400,000	420,000	$8,400,000	420,000	$8,400,000	420,000	8,400,000
High Rise/ Fire Seperation Premiun	$1.50	GSF	420,000	630,000	420,000	630,000	420,000	$630,000				
*Partitions include sound attenuation, tape & joint compound finish												
				---------- $10,983,818		---------- $10,983,818		---------- $10,983,818		---------- $10,353,818		---------- $10,353,818
C1020 INTERIOR DOORS												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
081113 HOLLOW METALWORK												
081416 WOOD AND PLASTIC DOORS												
087100 DOOR HARDWARE												
Interior Door, Frame and Hardware	$6.50	GSF	420,000	2,730,000	420,000	2,730,000	420,000	$2,730,000	420,000	$2,730,000	420,000	2,730,000
High Rise/ Fire Seperation Premiun	$0.50	GSF	420,000	210,000	420,000	210,000	420,000	$210,000	420,000	$210,000	420,000	210,000
080001 METAL WINDOWS*												
Aluminum (Frame, Door, Glass, Glazing and Hdw):												
Vest - dbl	$9,000.00	PR	8	72,000	8	72,000	8	$72,000	8	$72,000	8	72,000
Main office -sgl	$4,400.00	EA	4	17,600	4	17,600	4	$17,600	4	$17,600	4	17,600
Media Center	$4,400.00	EA	4	17,600	4	17,600	4	$17,600	4	$17,600	4	17,600
Aluminum Storefront:												
Vestibule 10'	$88.00	SF	600	52,800	600	52,800	600	$52,800	600	$52,800	600	52,800
Main office 10'	$88.00	SF	1,200	105,600	1,200	105,600	1,200	$105,600	1,200	$105,600	1,200	105,600
083323 SPECIAL DOORS												
Dish drop window	$3,600.00	EA	1	3,600	1	3,600	1	$3,600	1	$3,600	1	3,600
Kitchen OH grille	$4,900.00	EA	1	4,900	1	4,900	1	$4,900	1	$4,900	1	4,900
Main office security grate	$25,000.00	LS	1	25,000	1	25,000	1	$25,000	1	$25,000	1	25,000
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				$3,239,100		$3,239,100		$3,239,100		$3,239,100		$3,239,100
C1030 FITTINGS												
050001 MISCELLANEOUS & ORNAMENTAL IRON*												
Gym equip. support & frame	$20,000.00	LS	1	20,000	1	20,000	1	$20,000	1	$20,000	1	20,000
Auditorium Railing	$50,000.00	LS	1	50,000	1	50,000	1	$50,000	1	$50,000	1	50,000
Auditorium Catwalk	$250,000.00	LS	1	250,000	1	250,000	1	$250,000	1	$250,000	1	250,000
Misc. metals	$1.50	GSF	420,000	630,000	420,000	630,000	420,000	$630,000	420,000	$630,000	420,000	630,000
062000 FINISH CARPENTRY												
Utility & closet shelving	$10,000.00	LS	1	10,000	1	10,000	1	$10,000	1	$10,000	1	10,000
Typ. window sill/apron (nic cw-gyn	$48.00	LF	5,000	240,000	5,000	240,000	5,000	$240,000	5,000	$240,000	5,000	240,000
Auditorium Panel and Millwork	$200,000.00	LS	1	200,000	1	200,000	1	$200,000	1	$200,000	1	200,000

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
Misc. wood trim	$1.50	GSF	420,000	630,000	420,000	630,000	420,000	$630,000	420,000	$630,000	420,000	630,000
Custom Casework:												
Admin desk	$15,000.00	LS	1	15,000	1	15,000	1	$15,000	1	$15,000	1	15,000
Circulation desk	$15,000.00	LS	1	15,000	1	15,000	1	$15,000	1	$15,000	1	15,000
<u>102113 COMPARTMENTS & CUBICLES</u>												
Solid Plastic Toilet Partitions	$0.70	GSF	420,000	294,000	420,000	294,000	420,000	$294,000	420,000	$294,000	420,000	294,000
<u>102813 TOILET & BATH ACCESSORIES</u>												
Toilet Accessories	$0.45	GSF	420,000	189,000	420,000	189,000	420,000	$189,000	420,000	$189,000	420,000	189,000
<u>101100 MARKERBOARDS & TACKBOARDS</u>												
Marker Board Tack board	$1.20	GSF	420,000	504,000	420,000	504,000	420,000	$504,000	420,000	$504,000	420,000	504,000
Display cases - allow	$35,000.00	LS	1	35,000	1	35,000	1	$35,000	1	$35,000	1	35,000
<u>109000 MISCELLANEOUS SPECIALTIES</u>												
Lockers - Student	$330.00	EA	1,650	544,500	1,650	544,500	1,200	$396,000	1,650	$544,500	1,650	544,500
Lockers - Athletics	$315.00	EA	500	157,500	500	157,500	500	$157,500	500	$157,500	500	157,500
Wall & corner guards - allow	$15,000.00	LS	1	15,000	1	15,000	1	$15,000	1	$15,000	1	15,000
Fire extinguisher and cab - allow	$510.00	EA	35	17,850	35	17,850	35	$17,850	35	$17,850	35	17,850
Cubicle curtain track w/ curtain - he	$1,500.00	EA	4	6,000	4	6,000	4	$6,000	4	$6,000	4	6,000
Misc. specialties	$25,000.00	LS	1	25,000	1	25,000	1	$25,000	1	$25,000	1	25,000
<u>101400 IDENTIFYING DEVICES</u>												
Building directory - allow	$5,000.00	EA	1	5,000	1	5,000	1	$5,000	1	$5,000	1	5,000
Dedication plaque	$4,200.00	EA	1	4,200	1	4,200	1	$4,200	1	$4,200	1	4,200
Door signage plaque	$0.18	GSF	420,000	75,600	420,000	75,600	420,000	$75,600	420,000	$75,600	420,000	75,600
				---------- $3,932,650		---------- $3,932,650		---------- $3,784,150		---------- $3,932,650		---------- $3,932,650
TOTAL C10 - INTERIOR CONSTRUCTION				**$18,155,568**		**$18,155,568**		**$18,007,068**		**$17,525,568**		**$17,525,568**
C20 - STAIRS												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
C2010 STAIR CONSTRUCTION												
<u>050001 MISCELLANEOUS & ORNAMENTAL IRON*</u>												
Metal Pan Stair w/Rails:												
Main lobby	$75,000.00	FLT	2	150,000	2	150,000	2	$150,000	2	$150,000	2	150,000
Egress corridor stair	$40,000.00	FLT	21	840,000	21	840,000	21	$840,000	21	$840,000	21	840,000
Stage stair	$6,500.00	FLT	2	13,000	2	13,000	2	$13,000	2	$13,000	2	13,000
Interior Rails - Allow	$0.35	GSF	420,000	147,000	420,000	147,000	420,000	$147,000	420,000	$147,000	420,000	147,000
Upgrade existing Stair	$9,500.00	FLTS										
<u>033000 CAST IN PLACE CONCRETE</u>												
Conc stair pan fill - full flt	$1,500.00	FLTS	23	34,500	23	34,500	23	$34,500	23	$34,500	23	34,500
				----------		----------		----------		----------		----------
				$1,184,500		$1,184,500		$1,184,500		$1,184,500		$1,184,500
C2020 STAIR FINISHES												
<u>090002 TILE*</u>												
Main Stair Finish	$10,000.00	FLTS	2	20,000	2	20,000	2	$20,000	2	$20,000	2	20,000
<u>090005 RESILIENT FLOORING*</u>												
Rubber treads, risers and Landing	$3,200.00	FLTS	21	67,200	21	67,200	21	$67,200	21	$67,200	21	67,200
<u>090007 PAINTING*</u>												
Paint stair & rails - full flt	$2,400.00	FLTS	23	55,200	23	55,200	23	$55,200	23	$55,200	23	55,200
<u>095000 WOOD FLOOR</u>												
Stage stair tread	$2,750.00	FLTS	2	5,500	2	5,500	2	$5,500	2	$5,500	2	5,500

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
				----------		----------		----------		----------		----------
				$147,900		$147,900		$147,900		$147,900		$147,900
TOTAL C20 - STAIRS				**$1,332,400**		**$1,332,400**		**$1,332,400**		**$1,332,400**		**$1,332,400**
C30 - INTERIOR FINISHES												
C3010 WALL FINISHES												
071000 DAMPPROOF., WATERPROOF. & CAULKING*												
Joint sealants - interior	$0.55	GSF	420,000	231,000	420,000	231,000	420,000	$231,000	420,000	$231,000	420,000	231,000
098400 ACOUSTICAL WALL TREATMENT												
Tectum Wall Panel:												
2" Gymnasium -allow	$20.00	SF	2,000	40,000	2,000	40,000	2,000	$40,000	2,000	$40,000	2,000	40,000
Fabric Wrapped Acoustical Panels - Allow:												
Stage	$34.00	SF	500	17,000	500	17,000	500	$17,000	500	$17,000	500	17,000
Café	$34.00	SF	1,500	51,000	1,500	51,000	1,500	$51,000	1,500	$51,000	1,500	51,000
Corridor	$34.00	SF	2,500	85,000	2,500	85,000	2,500	$85,000	2,500	$85,000	2,500	85,000
Music class rm	$34.00	SF	500	17,000	500	17,000	500	$17,000	500	$17,000	500	17,000
Band class rm	$34.00	SF	500	17,000	500	17,000	500	$17,000	500	$17,000	500	17,000
IMC	$34.00	SF	500	17,000	500	17,000	500	$17,000	500	$17,000	500	17,000
090002 TILE*												
Ceramic Wall Tile:												
Toilet rm	$22.00	SF	28,000	616,000	28,000	616,000	28,000	$616,000	28,000	$616,000	28,000	616,000
Janitor closet	$22.00	SF	500	11,000	500	11,000	500	$11,000	500	$11,000	500	11,000
Stair hall	$23.50	SF	7,500	176,250	7,500	176,250	7,500	$176,250	7,500	$176,250	7,500	176,250
Corridor	$23.50	SF	55,000	1,292,500	55,000	1,292,500	55,000	$1,292,500	55,000	$1,292,500	55,000	1,292,500
Kitchen	$23.00	SF	2,500	57,500	2,500	57,500	2,500	$57,500	2,500	$57,500	2,500	57,500
Café - allow	$22.00	SF	2,500	55,000	2,500	55,000	2,500	$55,000	2,500	$55,000	2,500	55,000
090007 PAINTING*												
Vinyl wall covering		NIC										
Interior painting- walls	$2.10	GSF	420,000	882,000	420,000	882,000	420,000	$882,000	420,000	$882,000	420,000	882,000
				----------		----------		----------		----------		----------

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
				$3,565,250		$3,565,250		$3,565,250		$3,565,250		$3,565,250
C3020 FLOOR FINISHES												
Interior Finish	$13.00	GSF	420,000	5,460,000	420,000	5,460,000	420,000	$5,460,000	420,000	$5,460,000	420,000	5,460,000
				----------		----------		----------		----------		----------
				$5,460,000		$5,460,000		$5,460,000		$5,460,000		$5,460,000
C3030 CEILING FINISHES												
ACT/ Gyp and Soffit	$10.00	GSF	420,000	4,200,000	420,000	4,200,000	420,000	$4,200,000	420,000	$4,200,000	420,000	4,200,000
				----------		----------		----------		----------		----------
				$4,200,000		$4,200,000		$4,200,000		$4,200,000		$4,200,000
TOTAL C30 - INTERIOR FINISHES				**$13,225,250**		**$13,225,250**		**$13,225,250**		**$13,225,250**		**$13,225,250**
D. SERVICES												
D10 - CONVEYING												
D1010 ELEVATORS & LIFTS												
140001 ELEVATORS*												
Stage lift		N/A										
Passenger elevator	$60,000.00	STOP	10	600,000	10	600,000	10	$600,000	9	$540,000	9	540,000
050001 MISCELLANEOUS & ORNAMENTAL IRON*												
Elev. framing	$3,600.00	LOC	2	7,200	2	7,200	2	$7,200	2	$7,200	2	7,200
Elev. pit ladder	$1,500.00	LOC	2	3,000	2	3,000	2	$3,000	2	$3,000	2	3,000
Elev. Sump grate	$750.00	LOC	2	1,500	2	1,500	2	$1,500	2	$1,500	2	1,500
Elev. Louver	$1,500.00	LOC	2	3,000	2	3,000	2	$3,000	2	$3,000	2	3,000
				----------		----------		----------		----------		----------
				$614,700		$614,700		$614,700		$554,700		$554,700

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
TOTAL D10 - CONVEYING				**$614,700**		**$614,700**		**$614,700**		**$554,700**		**$554,700**
D20 - PLUMBING												
D2010 PLUMBING FIXTURES												
Plumbing - Building	$18.00	GSF	420,000	7,560,000	420,000	7,560,000	420,000	$7,560,000	420,000	$7,560,000	420,000	7,560,000
High Rise Mechanical Premium	$0.50	GSF	420,000	210,000	420,000	210,000	420,000	$210,000				
				----------		----------		----------		----------		----------
				$7,770,000		$7,770,000		$7,770,000		$7,560,000		$7,560,000
TOTAL D20 - PLUMBING				**$7,770,000**		**$7,770,000**		**$7,770,000**		**$7,560,000**		**$7,560,000**
D30 - HVAC												
D3010 HVAC												
HVAC - Building	$50.00	GSF	420,000	21,000,000	420,000	21,000,000	420,000	$21,000,000	420,000	$21,000,000	420,000	21,000,000
High Rise Mechanical Premium	$2.00	GSF	420,000	840,000	420,000	840,000	420,000	$840,000				
				----------		----------		----------		----------		----------
				$21,840,000		$21,840,000		$21,840,000		$21,000,000		$21,000,000
TOTAL D30 - HVAC				**$21,840,000**		**$21,840,000**		**$21,840,000**		**$21,000,000**		**$21,000,000**
D40 - FIRE PROTECTION												
D4010 SPRINKLERS												
210001 FIRE SUPPRESSION*												
Fire pump	$110,000.00	LS	1	110,000	1	110,000	1	110,000	1	110,000	1	110,000
Sprinkler - Building	$5.15	GSF	420,000	2,163,000	420,000	2,163,000	420,000	2,163,000	420,000	2,163,000	420,000	2,163,000

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
High Rise Mechanical Premium	$1.00	GSF	420,000	420,000	420,000	420,000	420,000	420,000				
				---------- $2,693,000		---------- $2,693,000		---------- $2,693,000		---------- $2,273,000		---------- $2,273,000
TOTAL D40 - FIRE PROTECTION				**$2,693,000**		**$2,693,000**		**$2,693,000**		**$2,273,000**		**$2,273,000**
D50 - ELECTRICAL												
D5010 ELECTRICAL SERVICE & DISTRIBUTION												
260001 ELECTRICAL*												
Electrical - Building	$5.00	GSF	420,000	2,100,000	420,000	2,100,000	420,000	2,100,000	420,000	2,100,000	420,000	2,100,000
Emergency Generator	$250,000.00	LS	1	250,000	1	250,000	1	250,000	1	250,000	1	250,000
High Rise Electrical Premium	$2.50	GSF	420,000	1,050,000	420,000	1,050,000	420,000	1,050,000				
				---------- $3,400,000		---------- $3,400,000		---------- $3,400,000		---------- $2,350,000		---------- $2,350,000
D5020 LIGHTING & BRANCH WIRING												
260001 ELECTRICAL*												
Electrical - Building	$8.00	GSF	420,000	3,360,000	420,000	3,360,000	420,000	3,360,000	420,000	3,360,000	420,000	3,360,000
Lighting Control	$2.50	GSF	420,000	1,050,000	420,000	1,050,000	420,000	1,050,000	420,000	1,050,000	420,000	1,050,000
				---------- $4,410,000		---------- $4,410,000		---------- $4,410,000		---------- $4,410,000		---------- $4,410,000
D5030 COMMUNICATION & SECURITY												
260001 ELECTRICAL*												
Security	$4.00	GSF	420,000	1,680,000	420,000	1,680,000	420,000	$1,680,000	420,000	1,680,000	420,000	1,680,000
Tele/data cabling, racks and switch	$9.00	GSF	420,000	3,780,000	420,000	3,780,000	420,000	$3,780,000	420,000	3,780,000	420,000	3,780,000
AV and Sound System	$1.50	GSF	420,000	630,000	420,000	630,000	420,000	$630,000	420,000	630,000	420,000	630,000

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
				----------		----------		----------		----------		----------
				$6,090,000		$6,090,000		$6,090,000		$6,090,000		$6,090,000
D5090 OTHER ELECTRICAL SYSTEMS												
260001 ELECTRICAL*												
Fire Alarm/Mass Notification	$4.25	GSF	420,000	1,785,000	420,000	1,785,000	420,000	1,785,000	420,000	1,785,000	420,000	1,785,000
Devices	$4.00	GSF	420,000	1,680,000	420,000	1,680,000	420,000	1,680,000	420,000	1,680,000	420,000	1,680,000
Clocks and PA	$2.65	GSF	420,000	1,113,000	420,000	1,113,000	420,000	1,113,000	420,000	1,113,000	420,000	1,113,000
Gym/Café Sound System	$1.30	GSF	420,000	546,000	420,000	546,000	420,000	546,000	420,000	546,000	420,000	546,000
Lighting Protection	$0.45	GSF	420,000	189,000	420,000	189,000	420,000	189,000	420,000	189,000	420,000	189,000
Mechanical Wiring	$1.25	GSF	420,000	525,000	420,000	525,000	420,000	525,000	420,000	525,000	420,000	525,000
Misc. Electrical	$1.00	GSF	420,000	420,000	420,000	420,000	420,000	420,000	420,000	420,000	420,000	420,000
				----------		----------		----------		----------		----------
				$6,258,000		$6,258,000		$6,258,000		$6,258,000		$6,258,000
TOTAL D50 - ELECTRICAL				**$20,158,000**		**$20,158,000**		**$20,158,000**		**$19,108,000**		**$19,108,000**
E. EQUIPMENT & FURNISHINGS												
E10 - EQUIPMENT												
E1010 COMMERCIAL EQUIPMENT												
114000 FOOD SERVICE EQUIPMENT												
Kitchen equipment & casework	$1,250,000.00	LS	1	1,250,000	1	1,250,000	1	1,250,000	1	1,250,000	1	1,250,000
				----------		----------		----------		----------		----------
				$1,250,000		$1,250,000		$1,250,000		$1,250,000		$1,250,000
E1090 OTHER EQUIPMENT												
113100 APPLIANCES												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
Staff kitchen refrigerator	$1,800.00	EA	6	10,800	6	10,800	6	10,800	6	10,800	6	10,800
Staff kitchen microwave	$1,200.00	EA	6	7,200	6	7,200	6	7,200	6	7,200	6	7,200
Medical office refrigerator w/ice	$1,750.00	EA	2	3,500	2	3,500	2	3,500	2	3,500	2	3,500
Stackable washer and dryer - kitchen		NIC										
116600 ATHLETIC & SPORTS EQUIPMENT												
Basketball backstops - electric	$9,800.00	EA	8	78,400	8	78,400	8	78,400	8	78,400	8	78,400
Wall padding - 6'	$15.00	SF	1,800	27,000	1,800	27,000	1,800	27,000	1,800	27,000	1,800	27,000
Motorized gym divider curtain (62'	$21.00	SF	5,000	105,000	5,000	105,000	5,000	105,000	5,000	105,000	5,000	105,000
Volley ball court equip.	$750.00	EA	3	2,250	3	2,250	3	2,250	3	2,250	3	2,250
Scoreboard	$25,000.00	EA	3	75,000	3	75,000	3	75,000	3	75,000	3	75,000
PT floor mats		NIC										
Telescoping bleachers - elec op	$250,000.00	LS	1	250,000	1	250,000	1	250,000	1	250,000	1	250,000
116143 THEATRICAL EQUIPMENT												
Stage curtains and Rigging	$140,000.00	LS	1	140,000	1	140,000	1	140,000	1	140,000	1	140,000
Theater Lighting and Control	$275,000.00	LS	1	275,000	1	275,000	1	275,000	1	275,000	1	275,000
Theater AV System	$250,000.00	LS	1	250,000	1	250,000	1	250,000	1	250,000	1	250,000
Theater Seating	$310.00	EA	1,000	310,000	1,000	310,000	1,000	310,000	1,000	310,000	1,000	310,000
115213 PROJECTION SCREENS												
Projection screen - stage	$20,000.00	EA	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000
Projection screen - media center	$5,000.00	EA	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
119000 MISC. EQUIPMENT												
Smart boards		NIC										
Metal storage shelving		NIC										
Book security equipment		NIC										
Kiln	$3,500.00	EA	1	3,500	1	3,500	1	3,500	1	3,500	1	3,500
Science Room Equipment	$375,000.00	EA	1	375,000	1	375,000	1	375,000	1	375,000	1	375,000
				---------- $1,937,650		---------- $1,937,650		---------- $1,937,650		---------- $1,937,650		---------- $1,937,650
TOTAL E10 - EQUIPMENT				**$3,187,650**		**$3,187,650**		**$3,187,650**		**$3,187,650**		**$3,187,650**

E20 - FURNISHINGS

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
E 2010 FIXED FURNISHINGS												
<u>129000 MISC. FURNISHINGS</u>												
Window Meco shade - manual	$7.50	SF	30,000	225,000	30,000	225,000	30,000	225,000	30,000	225,000	30,000	225,000
Motor Op Shade Premium	$100,000.00	LS	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
Int. office/class window shades	$50,000.00	LS	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
<u>123553 CLASSROOM CASEWORK</u>												
Casework	$8.00	GSF	420,000	3,360,000	420,000	3,360,000	420,000	3,360,000	420,000	3,360,000	420,000	3,360,000
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				$3,735,000		$3,735,000		$3,735,000		$3,735,000		$3,735,000
TOTAL E20 - FURNISHINGS				**$3,735,000**		**$3,735,000**		**$3,735,000**		**$3,735,000**		**$3,735,000**
<u>F. SPECIAL CONSTRUCTION & DEMOLITION</u>												
TOTAL F10 - SPECIAL CONSTRUCTION				**$0**		**$0**		**$0**		**$0**		**$0**
F20 - SELECTIVE BUILDING DEMOLITION												
F2010 BUILDING ELEMENTS DEMOLITION												
Demolish toilet /locker storage bldg	$8.00	GSF							12,720	$101,760		
Demolish Garage's	$6.00	GSF							1,380	$8,280		
Demolish Field house	$6.00	GSF							5,036	$30,216		
Demolish Grandstand	$3.00	GSF							168,000	$504,000		
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				$0		$0		$0		$644,256		$0
F2020 HAZARDOUS COMPONENTS ABATEMENT												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
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				$0		$0		$0		$0		$0
TOTAL F20 - SELECTIVE BUILDING DEMOLITION				**$0**		**$0**		**$0**		**$644,256**		**$0**
G. BUILDING SITEWORK												
G10 - SITE PREPARATION												
G1010 SITE CLEARING												
311000 SITE PREPARATION & CLEARING												
Construction Fence	12.50	LF	4,200	52,500	4,200	52,500	4,200	52,500	4,500	56,250	4,300	53,750
Erosion Control	9.00	LF	3,600	32,400	3,600	32,400	3,600	32,400	3,300	29,700	3,700	33,300
Erosion control Maintance	25,000.00	LS	1	25,000	1	25,000	1	25,000	1	25,000	1	25,000
Site Preparation	1.25	SF	894,385	1,117,981	894,385	1,117,981	894,385	1,117,981	700,000	875,000	776,525	970,656
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				$1,227,881		$1,227,881		$1,227,881		$985,950		$1,082,706
G1020 SITE DEMOLITION & RELOCATIONS												
Remove Existing:												
Strip and Demo site	0.90	SF	894,385	804,947	894,385	804,947	894,385	804,947	700,000	630,000	776,525	$698,873
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				$804,947		$804,947		$804,947		$630,000		$698,873
G1030 SITE EARTHWORK												
310000 EARTHWORK												
Site Cut	$15.00	CY	125,000	1,875,000	240,000	3,600,000	250,000	3,750,000	60,000	900,000	60,000	900,000
Dispose Surplus Mat'l	$50.00	CY	125,000	6,250,000	240,000	12,000,000	250,000	12,500,000	30,000	1,500,000	20,000	1,000,000
Site Fill (import)	$16.00	CY	10,000	160,000	15,000	240,000	20,000	320,000	10,000	160,000	10,000	160,000
Site Fill (reuse)	$15.00	CY							50,000	750,000	60,000	900,000

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
Site grading	$1.10	SY	99,375	109,313	99,375	109,313	99,375	109,313	71,000	78,100	71,000	78,100
Dewatering	$100,000.00	LS	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
Site Supervision , layout and Logist	$500,000.00	LS	1	500,000	1	500,000	1	500,000	1	500,000	1	500,000
Ledge Removal Allowance	$100,000.00	LS	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
Replace Unsuitable Mat'l	100.00	CY							35,000	3,500,000	25,000	2,500,000
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				$9,094,313		$16,649,313		$17,379,313		$7,588,100		$6,238,100
G1040 HAZARDOUS WASTE REMEDIATION												
Soil classifications		NIC										
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				$0		$0		$0		$0		$0
TOTAL G10 - SITE PREPARATION				**$11,127,140**		**$18,682,140**		**$19,412,140**		**$9,204,050**		**$8,019,679**
G20 - SITE IMPROVEMENTS												
G2010 ROADWAYS												
321000 PAVING AND CURBING												
Parking:												
Bituminous Pavement	29.80	SY	15,480	461,304	13,793	411,031	14,968	446,046	23,394	697,141	19,132	570,134
12" Gravel base - on site	18.00	CY	5,160	92,880	4,598	82,764	4,989	89,802	7,798	140,364	6,375	114,750
Granite Curbing	45.00	LF	9,800	441,000	8,500	382,500	9,700	436,500	12,000	540,000	8,200	369,000
Street Curb cut	22,000.00	EA	3	66,000	3	66,000	4	88,000	4	88,000	4	88,000
Parking/traffic signage	20,000.00	LS	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000
Parking line panting	30,000.00	LS	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000
Street patch @ utilities	25,000.00	LS	1	25,000	1	25,000	1	25,000	1	25,000	1	25,000
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				$1,136,184		$1,017,295		$1,135,348		$1,540,505		$1,216,884
G2020 PARKING LOTS												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
	INC ABOVE											
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				$0		$0		$0		$0		$0
G2030 PEDESTRIAN PAVING												
<u>321000 PAVING AND CURBING</u>												
4" Concrete pavement	9.50	SF	8,100	76,950	8,100	76,950	8,100	76,950	12,000	114,000	12,000	114,000
Concrete Entry pavement	25.00	SF	10,000	250,000	10,000	250,000	8,000	200,000	14,000	350,000	14,000	350,000
Bit Walkway Pavement	3.75	SF	15,200	57,000	15,200	57,000	32,000	120,000	16,000	60,000	16,000	60,000
8" Gravel base - on site	18.00	CY	700	12,600	700	12,600	700	12,600	1,035	18,630	1,035	18,630
Tactile warning paver	325.00	EA	16	5,200	16	5,200	22	7,150	16	5,200	16	5,200
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				$401,750		$401,750		$416,700		$547,830		$547,830
G2040 SITE DEVELOPMENT												
<u>323000 SITE IMPROVEMENTS</u>												
CIP Retaining Wall - 4'	265.00	LF	500	132,500	1,000	265,000	1,000	$265,000	1,000	265,000	1,000	265,000
CIP Retaining Wall - 6'	290.00	LF	500	145,000	1,000	290,000	1,000	$290,000	1,000	290,000	1,000	290,000
Site Amenities	1,000,000.00	LS	1	1,000,000	1	1,000,000	1	$1,000,000	1	1,000,000	1	1,000,000
Synthetic Sports Field :												
Field Safety Netting(2 loc)	50.00	LF	342	17,100	342	17,100	342	17,100	342	17,100	342	17,100
Bleachers	125.00	SEAT	5,000	625,000	5,000	625,000	5,000	625,000	5,000	625,000	5,000	625,000
Synthetic Field Surface	14.00	SF	95,000	1,330,000	95,000	1,330,000	95,000	1,330,000	95,000	1,330,000	200,000	2,800,000
12" Dynamic Stone base	48.00	CY	3,518	168,864	3,518	168,864	3,518	168,864	3,518	168,864	7,408	355,584
Filter fabric	1.00	SF	95,000	95,000	95,000	95,000	95,000	95,000	95,000	95,000	200,000	200,000
Field Draiange	1.20	SF	95,000	114,000	95,000	114,000	95,000	114,000	95,000	114,000	200,000	240,000
Perm Curb	48.00	LF	1,300	62,400	1,300	62,400	1,300	62,400	1,300	62,400	2,200	105,600
Scoreboard	45,000.00	EA	1	45,000	1	45,000	1	45,000	1	45,000	1	45,000
Field goal	7,500.00	EA	2	15,000	2	15,000	2	15,000	2	15,000	2	15,000
Misc Field equipment	10,000.00	EA	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000
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				$3,759,864		$4,037,364		$4,037,364		$4,037,364		$5,968,284

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
G2050 LANDSCAPING												
329000 PLANTING												
Lawn:												
6" Loam	55.00	CY	8,700	478,500	8,950	492,250	8,750	481,250	8,750	481,250	5,066	278,630
Rake, seed and fertlize	2.20	SY	52,000	114,400	53,700	118,140	52,500	115,500	52,500	115,500	30,400	66,880
Planting allowance	350,000.00	LS	1	350,000	1	350,000	1	350,000	1	350,000	1	350,000
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				$942,900		$960,390		$946,750		$946,750		$695,510
TOTAL G20 - SITE IMPROVEMENTS				**$6,240,698**		**$6,416,799**		**$6,536,162**		**$7,072,449**		**$8,428,508**
G30 - SITE MECHANICAL UTILITIES												
G3010 WATER SUPPLY												
330000 UTILITIES												
St. connection/ tap existing	15,000.00	LOC	1	15,000	1	15,000	1	15,000	1	15,000	1	15,000
4" Domestic (allow- 2 loc)	68.00	LF	100	6,800	100	6,800	100	6,800	100	6,800	100	6,800
6" Fire (allow- 2 loc)	82.00	LF	200	16,400	200	16,400	200	16,400	200	16,400	200	16,400
8" Main	94.50	LF	2,200	207,900	2,200	207,900	2,200	207,900	2,200	207,900	2,200	207,900
6" Lateral @ fire hydrant	79.00	LF	40	3,160	40	3,160	40	3,160	40	3,160	40	3,160
Hydrant	2,950.00	EA	4	11,800	4	11,800	4	11,800	4	11,800	4	11,800
8" Gate valve - main	1,450.00	EA	4	5,800	4	5,800	4	5,800	4	5,800	4	5,800
6" Gate valve - bldg	1,200.00	EA	2	2,400	2	2,400	2	2,400	2	2,400	2	2,400
6" Gate valve - hydrant	1,200.00	EA	4	4,800	4	4,800	4	4,800	4	4,800	4	4,800
4" Gate valve - bldg	1,500.00	EA	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
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				$275,560		$275,560		$275,560		$275,560		$275,560
G3020 SANITARY SEWER												
330000 UTILITIES												

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
St connection w/ new SMH	10,000.00	EA	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000
8" PVC	75.00	LF	1,000	75,000	1,000	75,000	1,000	75,000	1,000	75,000	1,000	75,000
Grease trap	25,000.00	EA	1	25,000	1	25,000	1	25,000	1	25,000	1	25,000
Sanitary manhole	4,000.00	EA	4	16,000	4	16,000	4	16,000	4	16,000	4	16,000
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				$126,000		$126,000		$126,000		$126,000		$126,000
G3030 STORM SEWER												
330000 UTILITIES												
Street connection	10,000.00	EA	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000
Catch basin	4,000.00	EA	45	180,000	45	180,000	45	180,000	54	216,000	54	216,000
Dbl Catch basin	4,800.00	EA	4	19,200	4	19,200	4	19,200	4	19,200	4	19,200
Drain manhole	4,000.00	EA	39	156,000	39	156,000	39	156,000	45	180,000	45	180,000
Area drain	1,500.00	EA	4	6,000	4	6,000	4	6,000	4	6,000	4	6,000
Stormceptor (1/rech)	18,500.00	EA	5	92,500	5	92,500	5	92,500	5	92,500	5	92,500
Piping:												
12"-18" CPP typical	68.00	LF	9,000	612,000	9,000	612,000	9,000	612,000	13,000	884,000	11,000	748,000
Perim found drain	34.75	LF	2,400	83,400	2,400	83,400	2,400	83,400	2,400	83,400	2,400	83,400
Underground recharge sys	27.50	SF	20,000	550,000	20,000	550,000	20,000	550,000	30,000	825,000	25,000	687,500
Relocate 84" Draiange Conduit	2,200.00	LF							1,000	2,200,000		
Relocate Sewer/Draiange lines	500,000.00	LS									1	500,000
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				$1,709,100		$1,709,100		$1,709,100		$4,516,100		$2,542,600
G3060 FUEL DISTRIBUTION												
Trench gas line	42.00	LF	500	21,000	500	21,000	500	21,000	500	21,000	500	21,000
Gas pad	3,000.00	LS	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000
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				$24,000		$24,000		$24,000		$24,000		$24,000

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL
TOTAL G30 - SITE MECHANICAL UTILITIES				**$2,134,660**		**$2,134,660**		**$2,134,660**		**$4,941,660**		**$2,968,160**
G40 - SITE ELECTRICAL UTILITIES												
G4010 ELECTRICAL DISTRIBUTION												
<u>330000 UTILITIES</u>												
Transformer pad	3,000.00	EA	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000
Generator pad - allow	3,500.00	EA	1	3,500	1	3,500	1	3,500	1	3,500	1	3,500
Conc. duct bank - elec/ tele/comm	75.00	LF	1,500	112,500	1,500	112,500	1,500	112,500	1,500	112,500	1,500	112,500
*Electrical poles and primary by others												
<u>260001 ELECTRICAL*</u>												
Spare or Empty Raceways:												
PVC Underground:												
2"	13.50	LF	3,000	40,500	3,000	40,500	3,000	40,500	3,000	40,500	3,000	40,500
4"	20.00	LF	6,000	120,000	6,000	120,000	6,000	120,000	6,000	120,000	6,000	120,000
Ground and Misc. Power	25,000.00	LS	1	25,000	1	25,000	1	25,000	1	25,000	1	
				----------		----------		----------		----------		----------
				$304,500		$304,500		$304,500		$304,500		$279,500
G4020 SITE LIGHTING												
<u>260001 ELECTRICAL*</u>												
Lighting Fixtures:												
Roadway Fixtures	4,400.00	EA	45	198,000	45	198,000	45	198,000	52	228,800	52	228,800
Pedestrian Lighting	3,975.00	EA	30	119,250	30	119,250	30	119,250	40	159,000	40	159,000
Specialty Lighting	50,000.00	LS	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
				0								
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				$367,250		$367,250		$367,250		$437,800		$437,800
TOTAL G40 - SITE ELECTRICAL UTILITIES				**$671,750**		**$671,750**		**$671,750**		**$742,300**		**$717,300**

DESCRIPTION	UNIT COST	UNIT	A.1- NEW QUANTITY	OPT A.1 TOTAL	A.2 - NEW QUANTITY	OPT. A2 TOTAL	A.3 - NEW QUANTITY	OPT. A3 TOTAL	B.1 - NEW QUANTITY	OPT. B.1 TOTAL	C.2 - NEW QUANTITY	OPT. C.2 TOTAL

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
PARKING GARAGE STRUCTURE				
Building cut and haul	25,000	CY	45.00	1,125,000
Excavate and Backfill	95,000	GSF	1.00	95,000
Garage Foundation	95,000	SF	18.00	1,710,000
2" Foundation Insulation	22,000	SF	2.90	63,800
Foundation Waterproofing	22,000	SF	4.50	99,000
12" Structural Concrete Deck	95,000	SF	35.00	3,325,000
Slab on grade	95,000	SF	12.50	1,187,500
Exterior Wall	20,000	SF	75.00	1,500,000
Alum louver	200	SF	65.00	13,000
Entry Door - sgl	4	EA	4,500.00	18,000
Mech Rm - sgl	4	EA	2,000.00	8,000
Overhead Door	2	EA	15,000.00	30,000
Int Partition	7,500	SF	26.00	195,000
Misc Metal	95,000	GSF	2.00	190,000
Interior Painting	95,000	GSF	2.00	190,000
Metal Pan stair	2	FLTS	35,000.00	70,000
Deck Waterproofing	95,000	GSF	9.00	855,000
Plumbing	95,000	GSF	4.00	380,000
Ventilation	95,000	GSF	7.50	712,500
Electrical	95,000	GSF	12.00	1,140,000
Sprinkler System	95,000	GSF	5.00	475,000

TOTAL PARKING GARAGE				13,381,800
PARKING GARAGE WITHIN BUILDING				
Excavate and Backfill	50,000	GSF	1.00	50,000
Garage Foundation	50,000	SF	18.00	900,000
2" Foundation Insulation	3,000	SF	2.90	8,700
Foundation Waterproofing	3,000	SF	4.50	13,500
12" Structural Concrete Deck	50,000	SF	35.00	1,750,000
Slab on grade	W/ BLDG			
Exterior Wall	9,800	SF	75.00	735,000
Alum louver	200	SF	65.00	13,000
Entry Door - sgl	4	EA	4,500.00	18,000
Mech Rm - sgl	4	EA	2,000.00	8,000
Overhead Door	2	EA	15,000.00	30,000
Int Partition	7,500	SF	26.00	195,000
Misc Metal	50,000	GSF	2.00	100,000
Interior Painting	50,000	GSF	2.00	100,000
Metal Pan stair	2	FLTS	35,000.00	70,000
Deck Waterproofing	50,000	GSF	9.00	450,000
Plumbing	50,000	GSF	4.00	200,000

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Ventilation	50,000	GSF	7.50	375,000
Electrical	50,000	GSF	12.00	600,000
Sprinkler System	50,000	GSF	5.00	250,000

TOTAL PARKING GARAGE				5,866,200

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
TRACK, SYNTHETIC FIELD AND BLEACHERS				
Main Field and Track:				
Synthetic track surface w/bit. base (2 lyr)	48,933	SF	12.00	587,196
6" Compacted gravel base	906	CY	36.00	32,616
6" Dense Grade Aggregate	906	CY	45.00	40,770
Perim track trench drain	1,308	LF	135.00	176,580
8" Loam - respread/augment	2,360	CY	15.00	35,400
Sod - playing fields	96,750	SF	10.00	967,500
Field under drain - perf pipe only	5,529	LF	32.00	176,928
12" Dynamic Stone base	3,523	CY	40.00	140,920
Filter fabric	190,262	SF	0.90	171,236
Concrete turf curb	220	LF	46.00	10,120
Football field goal	2	EA	7,500.00	15,000
Pole vault box	1	EA	1,500.00	1,500
Jumping pit	2	EA	10,000.00	20,000
Shot put pad and toe board	1	EA	1,000.00	1,000
Discus cage	1	LS	10,000.00	10,000
Fencing and Gates	1	LS	125,000.00	125,000
Aluminum bleachers and press box	1	LS	150,000.00	150,000
5" Concrete Pad at Bleacher	7,500	SF	6.00	45,000
12" Gravel pad base	166	CY	45.00	7,470
Restroom Facility	2,500	SF	500.00	1,250,000
Field Lighitng	4	EA	90,000.00	360,000
Field AV and Security	1	LS	150,000.00	150,000

TOTAL TRACK AND FIELD				4,474,236

RENOVATION AND ADDITION SITEWORK

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Site Preparation	843,482	SF	0.50	421,741
Remove Existing:				
Strip and Demo site	843,842	SF	0.25	210,961
Site Cut	8,000	CY	15.00	120,000
Dispose Surplus Mat'l	8,000	CY	35.00	280,000
Site grading	93,760	SY	0.70	65,632
Site Supervision , layout and Logistics	1	LS	250,000.00	250,000
Parking:				
Bituminous Pavement	18,962	SY	29.80	565,068
12" Gravel base - on site	6,230	CY	18.00	112,140
Granite Curbing	8,700	LF	45.00	391,500
Parking/traffic signage	1	LS	10,000.00	10,000
Parking line panting	1	LS	30,000.00	30,000
4" Concrete pavement	8,000	SF	9.50	76,000
Bit Walkway Pavement	10,000	SF	3.75	37,500
8" Gravel base - on site	445	CY	18.00	8,010
Tactile warning paver	16	EA	325.00	5,200
Site Amenities	1	LS	750,000.00	750,000
Sports Field :				
Field Safety Netting(2 loc)	400	LF	50.00	20,000
Portable Bleachers	1	LS	50,000.00	50,000
Scoreboard	1	EA	45,000.00	45,000
Synthetic turf field	70,000	SF	14.00	980,000
12" Dynamic Stone base	2,592	CY	48.00	124,416
Filter fabric	70,000	SF	1.00	70,000
Underfield drainage	70,000	SF	1.20	84,000
Conc curb	1,100	LF	48.00	52,800
6" CL Fence	750	LF	48.00	36,000
Misc Field equipment	1	LS	10,000.00	10,000
Lawn:				
6" Loam - ammend and respread	7,500	CY	30.00	225,000
Rake, seed and fertlize	45,000	CY	2.20	99,000
Planting allowance	1	LS	200,000.00	200,000
Water Service	1	LS	250,000.00	250,000
Sanitary service	1	LS	125,000.00	125,000
Electric Service	1	LS	250,000.00	250,000
Site Lighitng	1	LS	400,000.00	400,000

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Storm Draiange:				
Street connection	1	EA	10,000.00	10,000
Catch basin	45	EA	4,000.00	180,000
Drain manhole	40	EA	4,000.00	160,000
Area drain	2	EA	1,500.00	3,000
Stormceptor (1/rech)	2	EA	18,500.00	37,000
Piping:				
12"-18" CPP typical	10000	LF	68.00	680,000
Underground recharge sys	15000	SF	27.50	412,500

SUB TOTAL				7,837,467

Preliminary Design Pricing Table

▨ = Formula do not edit

Option (Description)	Total Gross Square Feet	Square Feet of Renovated Space ($*/SF)	Square Feet of New Construction ($*/SF)	Site, Building Takedown, Haz Mat Etc. ($*)	Estimated Total Construction** ($*)	Estimated Total Project Costs ($)	Remark
CODE UPGRADE	167,000 sf	167,000 sf $ 313.21 $/sf	- sf $ - $/sf	$ 30,072,287	$ 82,378,357 $ 493.28 $/sf	$ 102,972,946	
ADDITION RENOVATION	420,000 sf	98,000 sf $ 278.56 $/sf	322,000 sf $ 459.60 $/sf	$ 47,148,580	$ 222,438,660 $ 529.62 $/sf	$ 278,048,325	parking under fields incuded under site, etc , 95,000 sf -see AMF summary
OPTION A.1 NEW CONSTRUCTION ON DOHERTY SITE: PODS ON PARK	420,000 sf	- sf $ - $/sf	420,000 sf $ 461.04 $/sf	$ 41,423,534	$ 235,060,334 $ 559.67 $/sf	$ 293,825,418	underbuilding parking incuded under site, etc , 58,845 SF -see AMF summary
OPTION A.2 NEW CONSTRUCTION ON DOHERTY SITE: OLMSTED HOMAGE	420,000 sf	- sf $ - $/sf	420,000 sf $ 437.85 $/sf	$ 52,138,323	$ 236,035,323 $ 561.99 $/sf	$ 295,044,154	underbuilding parking incuded under site, etc , 58,845 SF -see AMF summary
OPTION A.3 NEW CONSTRUCTION ON DOHERTY SITE: HIGHLAND PROUD	420,000 sf	- sf $ - $/sf	420,000 sf $ 444.47 $/sf	$ 63,375,297	$ 250,052,697 $ 595.36 $/sf	$ 312,565,871	parking under fields incuded under site, etc , 95,000 sf -see AMF summary
OPTION B.1 NEW CONSTRUCTION ON FOLEY STADIUM SITE	420,000 sf	- sf $ - $/sf	420,000 sf $ 474.38 $/sf	$ 30,505,872	$ 229,745,472 $ 547.01 $/sf	$ 287,181,840	
OPTION C.2 NEW CONSTRUCTION ON CHANDLER MAGNET SITE + LAND	420,000 sf	- sf $ - $/sf	420,000 sf $ 438.90 $/sf	$ 29,769,806	$ 214,107,806 $ 509.78 $/sf	$ 267,634,758	

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* Marked Up Construction Costs

** Does not include Construction Contingency

***** District's Preferred Solution**

3.3.3 FINAL EVALUATION OF ALTERNATIVES

F. Summary of Merits & Limitations

1. Narrative
2. Site Ranking Matrix

Expanding on the three option types identified in the PDP (Base Repair, Renovation/Addition, and New Construction) the design team reviewed several variations of each of these schemes. Those selected for further study include the following:

- Code Upgrade
- Addition / Renovation
- New Construction on Existing Site
    - Option A.1 Pods on Park
    - Option A.2 Olmsted Homage
    - Option A.3 Highland Proud
- Option B.1 New Construction on Foley Stadium Site
- Option C.2 New Construction on Chandler Magnet School site with added land

Following is a description of the criteria used to evaluate each of the Options. The criteria are weighted from 1–5, 5 being the most important to the City and School District. The ratings were developed as part of the Steering committee and School meetings. Each of the options were given a score between 1 and 5 for each of these criteria. This score is then multiplied by the weight, and added cumulatively to determine the final score. A perfect score using this matrix would be 185.

SITE RANKING CRITERIA		
WEIGHT	CRITERIA	DESCRIPTION
5	ABILITY TO MEET BUILDING PROGRAM	Rated based on the ability for the site to support a building that meets the full educational program (organization, adjacencies, exterior access, daylight) as outlined in Section 3.1.2.
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	Cost of land acquisition or purchase of adjacent land are factored in the rating of this category.
5	COMPARATIVE STAFF & STUDENT IMPACT	Rated on the relative impact to the Doherty Staff and Students and to the school district as a whole.
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	Rated on the ability for the site to meet the desired site athletic field program.
4	CENTRAL TO DISTRICT/QUADRANT	Rated on the ability to achieve equitable access for high school students throughout the quadrant.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	Rated on a comparative cost/difficulties factor on the options reviewed. These factors include: soils conditions, foundation requirements needed to provide proper bearing, the amount of excavation required for the building and site, the amount of site retaining walls or slope mitigation,

		added features such as parking decks.
3	TRAFFIC IMPACTS & ACCESS	Rated on a combination of factors including vehicular & pedestrian access and potential impact on traffic.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	Rated on the extent to which the site could accommodate separate parent and bus circulation and parking requirements.
3	CONSTRUCTION SCHEDULE IMPACT	Rating reflects aspects of the site that may result in delays to the project target occupancy of Fall 2024 or extended construction beyond building occupancy.
1	ADJACENT USES & NEIGHBORHOOD IMPACT	Rated according to the current uses of the subject parcel as well compatible adjacencies for a School including: residential, business and publicly owned open space (i.e. parks, recreation fields, etc.).
1	UTILITIES & DEVELOPMENT ISSUES	Rated on the availability of utilities, including public sewer, water, electrical power, fiber, and natural gas, determine this criterion.

In the following pages, each of the options are ranked according to each of these categories. For additional information on each score, refer to the narratives in section 3.3.3.C Preliminary Design Options.

CODE UPGRADE

RATING SCALE: 0=Negative → 5=Positive

WEIGHT	CRITERIA	SCORE	NOTES
5	ABILITY TO MEET BUILDING PROGRAM	0	▪ Does not address educational program
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	5	▪ The Site is bounded by park land; there are no expansion options or acquisition issues.
5	COMPARATIVE STAFF & STUDENT IMPACT	1	▪ Comparatively the most disruption to Doherty staff and students
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	1	▪ No improvements to the existing baseball and softball fields
4	CENTRAL TO DISTRICT/QUADRANT	5	▪ The existing school site is recognized as central to the Doherty Quadrant.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	5	▪ No site development
3	TRAFFIC IMPACTS & ACCESS	1	▪ No improvements to the existing bus and parent circulation.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	1	▪ No improvements to the existing traffic issues
3	CONSTRUCTION SCHEDULE IMPACT	1	▪ Comparatively longer construction schedule due to phased occupied construction
1	ADJACENT USES & NEIGHBORHOOD IMPACT	4	▪ Current site of the school Construction would be disruptive
1	UTILITIES & DEVELOPMENT ISSUES	3	▪ Utilities are available and adequate. Because the development of the site is constrained, with phased construction, the score for this category is average
	TOTAL	**85**	

ADDITION RENOVATION

RATING SCALE: 0=Negative → 5=Positive

WEIGHT	CRITERIA	SCORE	NOTES
5	ABILITY TO MEET BUILDING PROGRAM	3	▪ Educational program organization and adjacencies are compromised
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	5	▪ The Site is bounded by park land; there are no expansion options or acquisition issues.
5	COMPARATIVE STAFF & STUDENT IMPACT	1	▪ Comparatively the most disruption to Doherty staff and students
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	3	▪ A single soccer/practice field above an open air parking deck is included
4	CENTRAL TO DISTRICT/QUADRANT	5	▪ The existing school site is recognized as central to the Doherty Quadrant.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	2	▪ Added cost for parking structure and retaining walls
3	TRAFFIC IMPACTS & ACCESS	3	▪ The existing Doherty site is limited to access from Highland Street only, which has limitations, and is subject to traffic congestion. Refer to Civil Narrative for Traffic analysis.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	3	▪ Separate bus and parent circulation. Parking deck may result in security issues.
3	CONSTRUCTION SCHEDULE IMPACT	1	▪ Comparatively the longest construction duration
1	ADJACENT USES & NEIGHBORHOOD IMPACT	4	▪ The existing school is an established location, so impact on the neighborhood is expected to be limited primarily to construction related activities. ▪ The portion of the site that is currently undeveloped is used by Newton Hill park for disc golf and trails. Elm Park, Newton Hill Park and Foley Stadium are all significant

			adjacencies to the site to be considered carefully as the design progresses. ▪ Comparatively longer duration of disruption due to construction activities
1	UTILITIES & DEVELOPMENT ISSUES	3	▪ Utilities are available and adequate. Because the development of the site is constrained, with phased construction, the score for this category is average
	TOTAL	**111**	

NEW CONSTRUCTION ON EXISTING SITE

OPTION A.1 PODS ON PARK

RATING SCALE: 0=Negative → 5=Positive

WEIGHT	CRITERIA	SCORE	NOTES
5	ABILITY TO MEET BUILDING PROGRAM	5	▪ Building program requirements can be satisfied. ▪ Greatest opportunities for views and daylight for all teaching spaces.
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	5	▪ The Site is bounded by park land; there are no expansion options or acquisition issues.
5	COMPARATIVE STAFF & STUDENT IMPACT	3	▪ Construction adjacent to occupied existing school building. Staff and students will have limited parking and no practice fields during construction.
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	3	▪ Limited field development is anticipated. A football/soccer/field hockey field is provided. ▪ Off-site fields are required to meet the athletic program.
4	CENTRAL TO DISTRICT/QUADRANT	5	▪ The existing school site is recognized as central to the Doherty Quadrant.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	3	▪ Short to moderate height retaining walls are anticipated to optimize site area available. ▪ Parking below building provided
3	TRAFFIC IMPACTS & ACCESS	3	▪ The existing Doherty site is limited to access from Highland Street only, which has limitations, and is subject to traffic congestion. Refer to Civil Narrative for Traffic analysis.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	4	▪ Bus and parent traffic are separated. ▪ 100 Parking spaces below building reduce surface parking, but may represent security issues
3	CONSTRUCTION SCHEDULE IMPACT	3	▪ Achieves occupancy of building in Fall 2024, with parking and field completion in Spring of 2025

1	ADJACENT USES & NEIGHBORHOOD IMPACT	4	▪ The existing school is an established location, so impact on the neighborhood is expected to be limited primarily to construction related activities. ▪ The portion of the site that is currently undeveloped is used by Newton Hill park for disc golf and trails. Elm Park, Newton Hill Park and Foley Stadium are all significant adjacencies to the site to be considered carefully as the design progresses. ▪ This option locates some of the parking below building, which may increase open/green space on the site.
1	UTILITIES & DEVELOPMENT ISSUES	3	▪ Utilities are available and adequate. Because the development of the site is constrained, with phased construction, the score for this category is average
	TOTAL	**143**	

NEW CONSTRUCTION ON EXISTING SITE

OPTION A.2 OLMSTED HOMAGE

RATING SCALE: 0=Negative → 5=Positive

WEIGHT	CRITERIA	SCORE	NOTES
5	ABILITY TO MEET BUILDING PROGRAM	4	▪ Building program requirements can be satisfied, however some teaching spaces are interior limited daylight options ▪ Academic area organization is not as intuitive as other options. ▪ Core facilities grouped on one level
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	5	▪ The Site is bounded by park land; there are no expansion options or acquisition issues.
5	COMPARATIVE STAFF & STUDENT IMPACT	3	▪ Construction adjacent to occupied existing school building. Staff and students will have limited parking and no practice fields during construction.
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	3	▪ Limited field development is anticipated. A football/soccer/field hockey field and a practice field are provided. ▪ Off-site fields are required to meet the athletic program.
4	CENTRAL TO DISTRICT/QUADRANT	5	▪ The existing school site is recognized as central to the Doherty Quadrant.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	3	▪ Short to moderate height retaining walls are anticipated to optimize site area available. ▪ Parking below building provided
3	TRAFFIC IMPACTS & ACCESS	3	▪ The existing Doherty site is limited to access from Highland Street only, which has limitations, and is subject to traffic congestion. Refer to Civil Narrative for Traffic analysis.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	4	▪ Bus and parent traffic are separated. ▪ +/- 165 Parking spaces below building reduce surface parking, but may represent

			security issues
3	CONSTRUCTION SCHEDULE IMPACT	3	▪ Achieves occupancy of building in Fall 2024, with parking and fields completion in Spring of 2025
1	ADJACENT USES & NEIGHBORHOOD IMPACT	4	▪ The existing school is an established location, so impact on the neighborhood is expected to be limited primarily to construction related activities. ▪ The portion of the site that is currently undeveloped is used by Newton Hill park for disc golf and trails. Elm Park, Newton Hill Park and Foley Stadium are all significant adjacencies to the site to be considered carefully as the design progresses. ▪ This option locates most of the parking below building, which increases open/green space availability.
1	UTILITIES & DEVELOPMENT ISSUES	3	▪ Utilities are available and adequate. ▪ Because the development of the site is constrained, with phased construction, the score for this category is average
	TOTAL	**138**	

NEW CONSTRUCTION ON EXISTING SITE

OPTION A.3 HIGHLAND PROUD

RATING SCALE: 0=Negative → 5=Positive

WEIGHT	CRITERIA	SCORE	NOTES
5	ABILITY TO MEET BUILDING PROGRAM	4	▪ Building program requirements can be satisfied, however some teaching spaces are interior with limited daylight options. ▪ Main Administration and Media Center are very remote from the academic wings on the upper levels.
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	5	▪ The Site is bounded by park land; there are no expansion options or acquisition issues.
5	COMPARATIVE STAFF & STUDENT IMPACT	3	▪ Construction adjacent to occupied existing school building. ▪ Comparatively greater construction impact due to elimination of the staff parking lot during construction. Staff and students will have very limited parking and no practice fields during construction.
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	3	▪ Limited field development is anticipated. A football/soccer/field hockey field elevated on an open-air parking deck is provided. ▪ Off-site fields are required to supplement the athletic program.
4	CENTRAL TO DISTRICT/QUADRANT	5	▪ The existing school site is recognized as central to the Doherty Quadrant.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	2	▪ Short to moderate height retaining walls are anticipated to optimize site area available. ▪ An open-air parking deck below the football fields is provided at a significant cost.
3	TRAFFIC IMPACTS & ACCESS	3	▪ The existing Doherty site is limited to access from Highland Street only, which has limitations, and is subject to traffic congestion. Refer to Civil Narrative for Traffic

			analysis.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	3	▪ Bus loop is completely separate from parent parking ▪ Parking deck for +/– 245 cars may result in issues with security and surveillance.
3	CONSTRUCTION SCHEDULE IMPACT	2	▪ Achieves occupancy of building in Fall 2024, with parking and field completion in Spring of 2025. ▪ Comparatively longer construction duration due to construction of parking deck below field.
1	ADJACENT USES & NEIGHBORHOOD IMPACT	4	▪ The existing school is an established location, so impact on the neighborhood is expected to be limited primarily to construction related activities. ▪ The portion of the site that is currently undeveloped is used by Newton Hill park for disc golf and trails. Elm Park, Newton Hill Park and Foley Stadium are all significant adjacencies to the site to be considered carefully as the design progresses.
1	UTILITIES & DEVELOPMENT ISSUES	3	▪ Utilities are available and adequate. Because the development of the site is constrained, with phased construction, the score for this category is average
	TOTAL	**129**	

NEW CONSTRUCTION ON ALTERNATE SITE

OPTION B.1 NEW CONSTRUCTION ON FOLEY STADIUM SITE

RATING SCALE: 0=Negative → 5=Positive

WEIGHT	CRITERIA	SCORE	NOTES
5	ABILITY TO MEET BUILDING PROGRAM	5	▪ Building program requirements can be satisfied.
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	3	▪ The Foley Stadium site is owned by Worcester Public schools. ▪ This option also indicates potential acquisition of additional vacant and residential back land to provide the desired number of parking and access via Norman Ave.
5	COMPARATIVE STAFF & STUDENT IMPACT	2	▪ The new facility could be constructed without impact on the Doherty site or student population. ▪ The loss of the District's only stadium and surrounding fields would be a detriment to the athletics programs throughout the Worcester Public School district. ▪ Replacement of the athletic facilities at the Foley Stadium site would represent a significant logistical and financial burden to the City, and would require completion prior to demolition of the existing stadium.
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	1	▪ Limited field development is anticipated. A single soccer/field hockey field is provided. With the loss of the stadium and fields currently existing on the Foley stadium site, the district would need to fund and construct replacement facilities elsewhere. ▪ Beaver Brook Park, across Chandler Street is operated and scheduled through the City's

			Parks Department. ▪ Beaver Brook is city-owned Park land protected under Article 97; any development would need to be a parks department project.
4	CENTRAL TO DISTRICT/QUADRANT	4	▪ The Foley Stadium site is relatively central to the district, especially with access to major feeder routes.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	1	▪ The Soils logs provided as reported under the Geotechnical review noted that the parcel is filled with a mix of urban fill, and coal ash. A system of piles foundations at a premium cost would be anticipated to support any structure on the site.
3	TRAFFIC IMPACTS & ACCESS	2	▪ This option would include several curb cuts along Chandler Street as well as a potential access to Abbott Street or Coombs Road ▪ Significant additional traffic congestion is anticipated if this site is selected. Refer to the updated Traffic Report.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	5	▪ Bus and parent circulation are separated in this option. ▪ The desired parking spaces may be accomplished with the acquisition of additional land. ▪ Refer to the Civil Narrative.
3	CONSTRUCTION SCHEDULE IMPACT	5	▪ An unoccupied/available site with room for construction staging is the most advantageous from a schedule standpoint. Construction is anticipated to meet the current occupancy goal of Fall 2024, but the schedule must factor in several additional months for structural piles and soils conditions. ▪ If replacement Foley Stadium facilities were not available prior to construction of the new school, there could be a significant schedule impact.

1	ADJACENT USES & NEIGHBORHOOD IMPACT	3	▪ The parcel backs up to the surrounding residential neighborhood; Buffers could be established to minimize the impact to the neighbors. ▪ Hours of operation for a high school are more extensive than those of the stadium and fields.
1	UTILITIES & DEVELOPMENT ISSUES	1	▪ Beaver Brook runs in a conduit though the site, and is assumed to be original to the site development in the 1920's. This 84" conduit would have to be relocated around the building, and also be supported on ground improvements or piles. ▪ A significant stormwater management system would be required to address the increased impervious site cover. Refer to Civil Narrative.
	TOTAL	**113**	

NEW CONSTRUCTION ON ALTERNATE SITE

OPTION C.2 NEW CONSTRUCTION ON CHANDLER MAGNET SITE + LAND

RATING SCALE: 0=Negative → 5=Positive

WEIGHT	CRITERIA	SCORE	NOTES
5	ABILITY TO MEET BUILDING PROGRAM	4	▪ Building program requirements can be satisfied; however, some teaching spaces are interior and without natural daylight.
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	2	▪ This option requires land acquisition of parcels owned by Worcester State Foundation Real Estate LLC, and potential rear land acquisitions from May Street Residences.
5	COMPARATIVE STAFF & STUDENT IMPACT	3	▪ The new facility could be constructed without impact on the Doherty site or student population. ▪ The current Chandler Magnet School students and Bilingual/ Dual Language programs would need to be relocated together. The district has advised that no existing facility within the district can accommodate all 500 students.
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	4	▪ Comparatively, the most athletic fields are provided in this option, including a football/soccer/field hockey field, a softball field and a practice field. ▪ Off-site fields are still required to meet the athletic program.
4	CENTRAL TO DISTRICT/QUADRANT	4	▪ The Chandler Magnet School site is geographically central to the district.
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking structures)	4	▪ Fields and building would have average development issues and related costs with some retaining wall construction anticipated.
3	TRAFFIC IMPACTS & ACCESS	2	▪ While the Chandler Magnet School site has the advantage of access from multiple streets, it is also across the street from Worcester State

			University, which experiences existing traffic congestion. ▪ Studies have shown that vehicular and pedestrian congestion will be increased significantly if this site is selected. Refer to updated traffic report.
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	5	▪ Bus and parent circulation is separated. ▪ The desired number of parking spaces is provided without a parking deck or garage.
3	CONSTRUCTION SCHEDULE IMPACT	5	▪ An unoccupied/available site with room for construction staging is the most advantageous from a schedule standpoint. Construction is anticipated to meet the current occupancy goal of Fall 2024.
1	ADJACENT USES & NEIGHBORHOOD IMPACT	3	▪ The Chandler Magnet School parcel includes an existing school and practice fields, and is surrounded by dense residential neighborhoods. ▪ The new four-story building would be directly adjacent to the abutting residential parcels. Buffers could be established to minimize the impact to the neighbors. ▪ The adjacent Worcester State University presents opportunities for mutually beneficial programs. ▪ Due to increased traffic and use of the site, neighborhood impact of a high school would be increased significantly from that of the existing elementary school.
1	UTILITIES & DEVELOPMENT ISSUES	3	▪ Existing 10” sanitary pipes and 30”-42” storm drain mains traverse the site in multiple locations (refer to the Civil Narrative.) These conduits would need to be re-laid around the building. Otherwise utilities are available and development is comparable to the other sites.

	TOTAL	**131**	

Refer to the following page for the full comparison matrix and explanation of the preferred solution.

2. Site Ranking Matrix

Below is a summary of the site ranking evaluations from each individual option. Refer to Section 3.3.3.F.1 for a detailed description of each criteria.

WEIGHT (1–5)	CRITERIA	CODE UPGRADE	ADDITION / RENOVATION	DOHERTY SITE: PODS ON PARK A.1	DOHERTY SITE: OLMSTED HOMAGE A.2	DOHERTY SITE: HIGHLAND PROUD A.3	FOLEY STADIUM SITE B.1	CHANDLER MAGNET SCHOOL SITE C.2
5	ABILITY TO MEET BUILDING PROGRAM	0	3	5	4	4	5	4
5	ACQUISITION ISSUES, NEGOTIATION & EXPANSION	5	5	5	5	5	3	2
5	COMPARATIVE STAFF & STUDENT IMPACT	1	1	3	3	3	2	3
4	ABILITY TO MEET SITE ATHLETICS PROGRAM	1	3	3	3	3	1	4
4	CENTRAL TO DISTRICT/QUADRANT	5	5	5	5	5	4	4
3	SITE DEVELOPMENT COSTS (Earth moving, soils, retaining walls, parking stuctures)	5	2	3	3	2	1	4
3	TRAFFIC IMPACTS & ACCESS	1	3	3	3	3	2	2
3	BUS & PARENT VEHICULAR CIRCULATION & PARKING	1	3	4	4	3	5	5
3	CONSTRUCTION SCHEDULE IMPACT	1	1	3	3	2	5	5
1	ADJACENT USES & NEIGHBORHOOD IMPACT	4	4	4	4	4	3	3
1	UTILITIES & DEVELOPMENT ISSUES	3	3	3	3	3	1	3
	WEIGHTED SCORE	**85**	**111**	**143**	**138**	**129**	**113**	**131**

PSR Preferred Solution: [To be finalized at 12/18/19 Building Committee Meeting]

3.3.4 PREFERRED SOLUTION

A. Updated Educational Program
B. Updated Space Summary
C. Sustainable Design
D. Building Floor Plans
E. Site Plan
F. Budget Statement for Preferred Solution
G. Updated Project Schedule
H. Supporting Documents

3.3.4 PREFERRED SOLUTION

A. Updated Educational Program

1. Updated Educational Program (redlined)
2. Updated Educational Program with Designer Responses (clean copy)
3. MA DESE Letter Regarding Chapter 74 Programs
4. Updated Adjacency Diagrams

DOHERTY MEMORIAL HIGH SCHOOL
Worcester Public Schools
EDUCATIONAL PROGRAM

Feasibility Study for submission to the Massachusetts School Building Authority
September 2019

Redline Copy: December 2019

Table of Contents

Introduction

Doherty Memorial High School (DMHS) is a community of learners committed to working together to develop the mindset and the skills necessary for all students to become college and career ready, and lifelong learners. The school empowers students to become critical and independent thinkers while fostering creativity and a growth mindset that supports the belief that all students can succeed. Doherty Memorial High School engages families, students, staff, and community members to work collaboratively to ensure the success of all members of the Doherty school community.

The students, staff and family have a sense of pride in the school as is evidenced by the enthusiastic and continued support of its academic and extracurricular activities. In the 2011 Decennial Report, the New England Association of Schools and Colleges (NEASC) noted in its accreditation report that the students have a sense of pride in their school. They are happy to be there each day and they feel safe and secure. This school pride can be seen as they cheer for each other on the playing field, on the stage, in their classrooms, and in our community. *Doherty Pride* is more than just a slogan at the school, it is something than can be witnessed in the care they show for each other, stepping up to assist a classmate in need or organizing a school-wide rally for Stand for the Silent, or the care they take in making the aging facility a home as they use their artistic talents to paint murals on the walls or decorate a classroom.

Doherty Pride is visible among the staff as well. Currently, 30 staff members are Doherty alumni, fifteen have had their children or relatives attend the school, and six currently have students attending or will attend the school next year. This adds to the sense of community that is present in the school and demonstrates a level of commitment to the core values that guide the work and support our students. As we began this phase of our journey towards planning a new building, faculty members were asked to share their opinions and their hopes for our students in a new building. A survey was distributed to the faculty had an 85% return/participation rate and yielded valuable information to guide us in the writing of this report. Many shared their excitement for being able to provide a more modern facility with state-of-the art technology to prepare our students to succeed in the twenty-first century. Teachers shared their ideas and their hopes for the school and for our students at faculty meetings, on surveys and many volunteered their time after school and during the summer to participate in the visioning process. This is just one way that they demonstrate their commitment to our students and their pride in our school and its programs.

The school is an integral part of the neighborhood and has long been supported by the community. Students are actively involved in our local community and partner with local agencies and business through internship programs. Each year over 70 local community members volunteer their time as Career Day speakers and share their career paths with our students. As a result, many speakers have opened their businesses to our student interns and volunteer to come back each year to work with our students as speakers, as AVID tutors, and as supporters of our performing arts and sports programs.

Doherty Memorial High School is located at 299 Highland Street, Worcester, MA and in the 2018-19 school year, DMHS had 1,529 students in grades nine through twelve. Opening its doors in fall 1966, the school was originally built to house students in grades ten through twelve. The school population increased with the inclusion of Grade 9 in 1983 and its student enrollment has been growing steadily since then.

Located on the west side of the city, the student body represents a cross-section of the local community. The school offers a range of academic and extra-curricular programs to serve its body of diverse student learners.

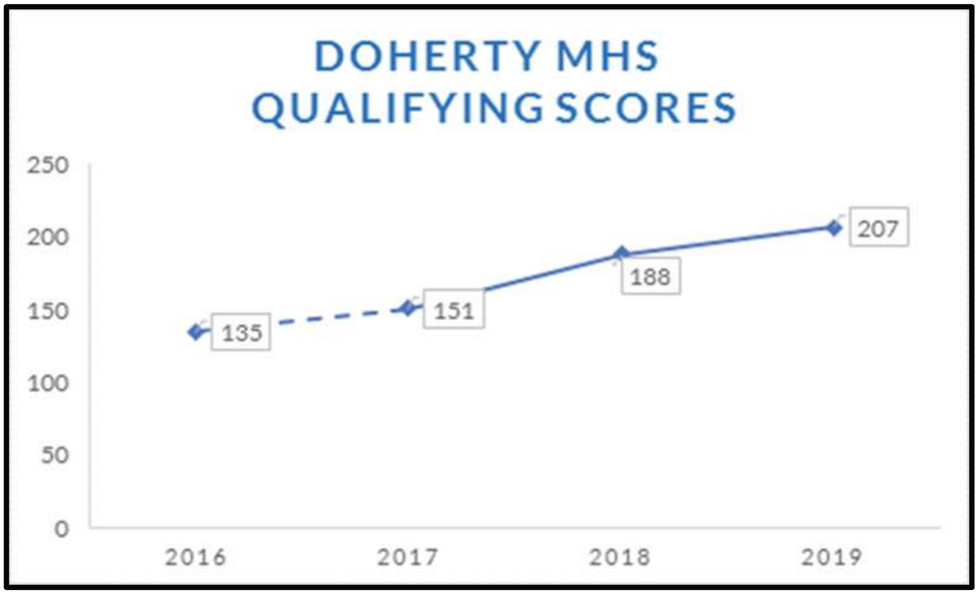
Table 1

Year: (As of October 1st each year)	Students	Female	Male	Asian	African American	Hispanic	Native American	White	Low Income	English Language Learners	Special Ed
2018-19	1529	708	816	115	298	469	16	627	763	285	230
2017-18	1544	709	835	141	292	635	16	460	724	300	252
2016-17	1553	708	845	147	284	485	14	623	729	354	257
2015-16	1467	686	781	157	246	443	15	606	591	259	218
2014-15	1428	689	739	159	244	421	587	17	835	279	214

Academic success and college and career readiness are the cornerstones on which Doherty Memorial High School's foundation of learning is built. The breadth of course offerings and the rigor of course content prepares students for post-secondary success. The school offers a range of courses to meet both student needs and student interest including 22 Advanced Placement courses in the humanities, and math and sciences, an Engineering and Technology Academy (ETA), visual and performing arts, world languages, Career Pathways program, as well as college and career preparatory courses at multiple levels. The curriculum is purposefully designed and adheres to the Worcester Public Schools (WPS) curriculum which aligns with the Massachusetts Department of Elementary and Secondary Education's Mass Core curriculum frameworks.

Students challenge themselves through participation in a variety of courses at every level. Students who participate in the Advanced Placement courses challenge themselves to engage in advanced-level course work and earn college credit based on qualifying scores on the AP exams. In 2019, students in AP courses at Doherty Memorial High School achieved 207 qualifying scores an increase from 151 qualifying scores prior to 2017.

Figure 1



(Mass. Insight Education & Research)

Other students challenge themselves by participating in Early College High School classes. Beginning in 2019-20, Doherty Memorial High School will be able to expand this opportunity by offering college courses on the Doherty campus, in partnership with Worcester State University and Quinsigamond Community College.

Course work at all-levels challenges students to engage in higher-order thinking and to apply these skills to authentic learning opportunities. The collaborative skills supported through these courses provide valuable tools for our students as they prepare to engage in a global economy and the world around them. Students apply these transferable skills to not only their class work but to opportunities that arise in the community through partnership and internship opportunities.

Doherty Memorial High School has a long tradition of academic excellence and many of its graduates go on to pursue their post-secondary education at a variety of colleges and universities located across the nation. Others further their education through training programs and enter the workforce or the military. Members of the class of 2019 were accepted to 188 different colleges and universities including: Assumption College, Becker College, Boston University, Brandeis University, Brown University, Clark University, College of the Holy Cross, George Washington University, Harvard University, Massachusetts College of Art and Design, Massachusetts College of Pharmacy, Morehouse College, Quinsigamond Community College, University of Oregon, University of San Diego, University of Massachusetts, Worcester Polytechnic Institute, and Worcester State University. The school profile for the class of 2018, with 376 members, shows that 87.4% of the students went onto some type of postsecondary schooling. More specifically, 54% to four-year college, 33% to two-year college, 0.4% to postsecondary and trade school, 8% to work, 2.4 % to the military, and 0.2% to other.

Student growth and their ability to make progress is essential for them to succeed and be college and career ready. John Hattie’s research provides insight into what makes a visible difference in student learning. Hattie identifies a hinge point, something that will provide a year’s academic growth within a year’s time. He determined that anything with a 0.40 or greater effect size will provide such positive growth for students (DeWitt, 2014). The teachers’ self-efficacy, the belief that they can positively affect growth in their students supports the school’s mission to create life-long learners and enhances the sense of community that is present in their day-to-day work.

While our students have been successful both during their academic career while at Doherty and in their post-secondary education and career paths, there is a need to expand our offerings to meet changing student needs and to better prepare our students to be capable and contributing community members who can make a positive difference in our global community. This can be done by expanding our current programs, adding additional career pathways and providing our students with increased opportunities that reflect the global society in which they will interact. Doherty Memorial High School needs additional space in the physical plant in order to offer programs to meet the needs of our students. When we welcome families and students to our school, we feel that they are joining our Doherty family and we await the opportunity to have our family reside in a building that effectively meets the needs of our family and that provides the 21st century learning environment that the Doherty family and our community needs and deserves.

As part of the New England Association of Schools and Colleges (NEASC) Decennial visit in 2011, the commission cited several commendations including: the school pride amongst faculty and students, the strong relationships within the community including local businesses, colleges and universities, the development of measurable academic, civic, and social expectations, the caring and unified faculty willing to maintain a positive attitude toward teaching and in spite of working in an inadequate facility, the safe, positive, and respectful school culture, the open access philosophy encouraging all students to take advanced placement courses, efforts by staff to build connections with students, the willingness of the principal to share leadership with faculty members and the willingness of faculty members to take on leadership roles including as providers of professional development, the identification and support of at-risk students and communication between support services staff members and families, and the onsite health center which provides students with preventative and wellness care. The commission also cited recommendations and expressed some concerns largely focused on the building. These included: ensuring equal access to programs and services in all parts of the building for all students and staff members including handicapped access to programs and services on all levels, ensuring sufficient levels of staffing, instructional materials, technology, equipment, supplies, facilities and library/media resources to fully implement the curriculum, immediately addressing all health and safety issues within the facility including safe chemical storage, making repairs to windows, doors, water fountains, shower facilities in the locker rooms, and plumbing, lavatories and ventilation in lavatories, providing adequate heating and ventilation throughout the facility, providing adequate seating in the cafeteria so that all students may sit down to eat, and providing science laboratory facilities to all implementation of the science curriculum. Doherty Memorial High School remains on warning status due to the facility although the commission is pleased that we have been accepted to participate in this Feasibility Study and we are grateful to the MSBA for allowing us to engage in this process.

As a part of the Feasibility Study phase of the process, members of the Doherty Memorial High School community conducted a comprehensive review of the guiding documents and engaged in a number of activities in order to reflect upon our current programming and to recommend revisions/additions to our current programming to inform and guide our plans for the future. In addition to reviewing and referencing the NEASC Decennial report of 2011, and our District/ School Improvement Plans, another guiding document for this work included *Defining Our Path: A Strategic Plan for Education in Worcester 2018-2023*. The report was written in collaboration with the superintendent and several members of our community and organizations including the Worcester Education Collaborative, the Worcester Regional Research Bureau and the Rennie Center with support from the Barr Foundation, the George I. Alden Trust, and the Greater Worcester Community Foundation. There were multiple committees and subcommittees and the members of these groups gathered input from focus groups including educators, families, students, and community members. The focus areas of this strategic plan include: Culture of

Innovation, Academic Excellence, Welcoming Schools, Investments in Educators, and Technology and Operations. The goals of the Strategic Plan and the goals of our district and school level initiatives have been woven throughout our Feasibility Study and Educational Programming Development process for our vision of the new facility and the focus on 21st century skill development.

Another integral part of this phase of the project included members of our community participating in several Educational Visioning and Programming sessions with David Stephen of New Vista Design and the team of architects from Lamoureux, Pagano and Associates (LPA) as part of our Feasibility Study.

A summary of the Visioning Sessions and Responses is included below.

During the month of June 2019, the Doherty Memorial High School Educational Working Group (EWG), a group of approximately 20-25 Worcester Public Schools administrative leaders, teachers, parents, and community partners, participated in three Educational Visioning Workshops run by New Vista Design and LPA Architects. Each workshop was a collaborative session designed to inform the Doherty Memorial High School Feasibility Study and design process. Participants were led through a step-by-step visioning process aimed at capturing their thinking about Worcester Public School's current and future educational goals and priorities and connecting them to best practices and possibilities in innovative school facility design. Additionally, a Faculty Visioning Workshop was held on June 3, 2019 in which the entire faculty of Doherty Memorial High School met to offer feedback on their educational and architectural priorities and goals, and a Community Visioning Workshop was held on the evening of June 24, 2019 to share priorities established by the EWG and ask for feedback from the larger Doherty Memorial High School community.

On **June 3, 2019** the entire faculty of Doherty Memorial High School participated in a one-and-a-half-hour Educational Visioning Workshop that explored the following topics:

- ***Priority Goals*** for the renovated and/or new DMHS educational program and facility
- Visions for the Future of DMHS's academic and extra-curricular programming

On **June 5, 2019**, the Doherty Memorial High School EWG participated in Educational Visioning Workshop One. The four-hour workshop explored the following topics:

- ***Priority Goals*** for the renovated and/or new DMHS educational program and facility

- ***21st century teaching and learning practices*** as connected to Worcester Public School's present and future educational vision
- ***Strengths, Challenges, Opportunities, and Goals (SCOG Analysis)*** associated with Worcester Public School's current academic programs as well as the vision for its renovated and/or new facility
- ***21st Century Learning Goals*** that distill the group's best thinking with regard to Worcester Public School's current and future educational programming and priorities

On **June 17, 2019** the Doherty Memorial High School EWG participated in Educational Visioning Workshop Two. The four-hour workshop explored the following topics:

- ***21st Century Design Patterns 1.0*** that participants would like to see employed within the renovated and/or new DMHS facility
- ***Guiding Principles*** and priorities for design of the renovated and/or new DMHS facility

On **June 24, 2019** the Doherty Memorial High School EWG participated in Educational Visioning Workshop Three. The four-hour workshop explored the following topics:

- ***Blue Sky Ideas*** for the renovated and/or new DMHS facility
- ***Key Spaces and Adjacencies*** for the renovated and/or new DMHS facility
- ***Bubble and Adjacency Diagramming*** for the renovated and/or new DMHS facility

On **June 24, 2019** an evening Community Visioning Workshop was help, that explored the following topics:

- ***Timeline and Tasks*** connected to the MSBA Feasibility Study for the renovated and/or new DMHS facility
- ***Educational and Architectural Priorities*** that the DMHS EWG had determined for the renovated and/or new DMHS facility

Each workshop generated ideas, goals, and aspirations, and identified urgent needs, critical infrastructures, etc. from the perspective of school and community stakeholders. This input helped shape the design proposal by providing information about the following areas: the physical layout and space adjacencies; expanding current educational programs to better serve students; increasing community access so that the school's resources and features are available beyond the school day; creating flexible space so that in the coming decades all students graduate with appropriate college and career readiness skills; increasing educational programming opportunities to address the needs of the students and the community.

In May 2019, Doherty Memorial High School staff members completed an online introductory survey. This tool asked participants to reflect and identify current features and practices that excite and motivate the school community, but then also asked respondents to look to the future and highlight their aspirations for the school. Finally, staff members were asked to think about the end result of this design process and to review a list of sample visionary goals in order to select one or more goals that they identified to be the most important and impactful on the stakeholders. For example, one respondent identified the importance of collaboration, and the opportunities available in a newly designed space with this still in mind:

> *I am excited about using different ways for students to collaborate both face-to-face and online.*
>
> *(In the future…) I would like to see more space for collaboration and more flexible space that can easily be adapted as our needs change throughout the school year as well as over the years. I would like to be able to have large spaces available for big groups to work together as well as small study areas for groups to meet with teachers. I would like to continue to expand the use of technology and to expand the media center to provide the students more of a collegiate experience for research.*

Another educator's goals were related to the goal of increasing interdisciplinary connections within their curriculum:

> *I am excited about all the available technology that benefits students learning English as A second language.*
>
> *(In the future…) I am excited about the available technology and project-based learning that integrates knowledge and skills from different content areas that students need to apply in their own student-led learning in order to tackle a real-world problem.*

On June 3, 2019, with the survey results as a catalyst for conversation, the entire faculty of Doherty Memorial High School participated in an Educational Visioning Workshop that explored their priority goals for the renovated and/or new Doherty Memorial High School educational program and facility, as well as their visions for the future of DMHS educational program and facility. The conversations and products from this session was grouped thematically and highlight the faculty's visions for the future.

Table 2

ACADEMIC PRIORITY	NUMBER OF VOTES

Core Values	30
Differentiated Instruction	22
Team Teaching	25
Cross Discipline Instruction	22
Student-Centered Learning	32
Social Emotional Learning	25
Professional Learning Communities	16
Technology Integration	45
Real World Connections	51
Service Learning	16
Internships and Field Studies	27
Community Service	23
Flexibility & Adaptability	22
Diverse Educational Opportunities	31
Career Pathways	28
Hands on / Project-based learning	32
STEM and STEAM	21
9th Grade Teams/Transition Support	29
Sustainability / Connections with Park	4

Faculty and community stakeholder input has guided the careful reflection of the current, and desired, educational programming and space design features within a modernized and purposefully planned space. For example, all stakeholders emphasized career pathways, which included desires for courses and programs of study that would better expose students to a variety of career options and help them develop skills and content knowledge. In addition, these career pathways would align with the needs and interests of underrepresented populations, and/or identify and implement programs for which there is a demonstrated student interest and need. With student survey data from Naviance, a comprehensive college and career readiness platform, relating to career interests, local, regional and national labor market analyses, and from a review of currently available local and area schools and training programs, Doherty Memorial High

School identified three additional Chapter 74 Career Vocational Technical Education programs that are included in this proposal.

Conversations have continued with members of LPA through July and August with input from school, district, and community stakeholders. Most recently, we participated in school visits to the following recent MSBA projects:

- West Bridgewater Middle High School; Grades 7-12, enrollment 619
- Billerica Memorial High School; grades 9-12, enrollment 1,610
- Dearborn STEM Academy; grades 6-12, enrollment 600

The lessons learned, the relationships developed, and the information gained during these visits have proven to be invaluable and have been incorporated into our educational visioning and programming as well as the overall design for the school. We are eternally grateful to the teams of people at each of these schools for their willingness to host our team and to share their insights and experiences. It is our hope, upon completion of our project, to be able to host teams from other schools that are engaged in this process. We are pleased to be working collaboratively with members of our community and with the MSBA in order to provide our students with the best educational program in a facility that supports teaching and learning for all.

A. Grade Configuration

Doherty Memorial High School currently serves students in grades 9-12 and the vision for the new school is to continue this grade configuration. The vision for the new school includes the addition of ninth grade academies designed to provide targeted supports to assist students in the transition from middle school to high school and to prepare them to be on track for graduation and college and career ready.

Ninth-Grade Academy/Teaming

Ninth grade and its associated transition to high school is often considered to be one of the most pivotal years in a student’s academic career. Many students struggle with the change of schedule/start time, the challenge of working with new and unfamiliar teachers, and the changes within their peer group coupled with the changes associated with this stage in their physical, emotional, and social development. The challenge of a new school environment can lead to increased stress and contribute to academic, social, and behavior problems for some students.

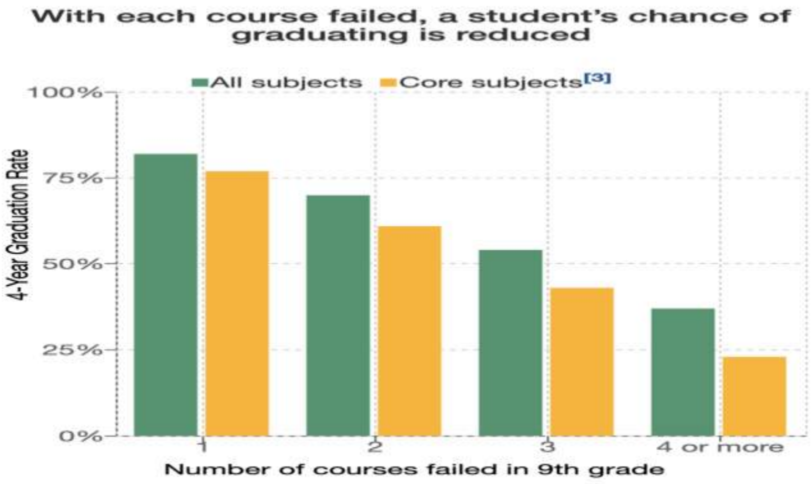
Neild’s (2009) research indicates:

> “Transitions in schooling are moments of great promise for children, holding the potential for personal growth, new learning, and greater independence and responsibility...Students who do not navigate a school transition well face the possibility of personal and academic turmoil and even falling off track for promotion and graduation. The entrance to ninth grade marks one such critical juncture in American schooling” (p.53).

The majority of the ninth-grade students transition from Forest Grove Middle School, Doherty’s primary feeder school. Each year, additional students enroll having completed the eighth grade in a private school, a school outside of the district, or a different Worcester Public Schools’ middle school (special permission). Ninth and tenth grade students in the Engineering and Technology Academy (ETA) are placed in a grade-specific team where they share the same core academic teachers. At present, this is the only Grade 9 team that is available to students.

Research indicates students who have experienced even a moderate level of difficulty in middle school are at a greater risk for not succeeding during the transition to high school (Neild, Balfanz & Herzog, 2007). Students who struggle in ninth grade may have to repeat courses, placing them off-track for graduation in four years with their cohort of peers. Data from the Massachusetts Department of Elementary and Secondary Education (DESE) indicates that 96% of students who pass all of their ninth-grade courses will graduate in four years. That number drops significantly as only 64% of students who failed at least one ninth-grade course graduate in four years. (Https://abcs.sites.digital.mass.gov/)

Figure 2



https://abcs.sites.digital.mass.gov/data/9/grade_9_data_viz2.csv

Statistics such as this indicate the need for ongoing, targeted support and a need for a change in programming to support ninth grade students. The recognition that laying a strong academic foundation to support ninth-grade students to be college and career ready and to graduate with their cohort of peers within four years, coupled with the ever-growing concern for reducing the number of ninth-grade students who fail classes, drives the desire to seek additional support for ninth-grade students.

We currently offer several programs to support students' transition to Grade 9. These programs include a fall Open House for students and families, outreach to middle school students to help students plan for course selection, an outreach program for parents to provide course information, a parent orientation prior to the start of the school year, and a two-day Jumpstart program prior to the start of school to support students and prepare them to have a successful start to ninth grade. While these supports are beneficial to students there is a demonstrated need for additional supports for ninth grade students.

Presently, ninth-grade students at DMHS attend classes that are scheduled in classrooms in areas designated for each academic discipline throughout the building. These frequent transitions are often a cause of stress for many new students who begin their high school career feeling lost or overwhelmed by a comprehensive high school schedule in a large building. Ninth-grade students participate in classes taught by different teachers who often do not share common students. Other than the ETA program, there is no central location for these ninth-grade students to attend classes or the opportunity for them to share a common group of teachers who could monitor their progress and plan coordinated supports.

Ellerbrock and Kiefer (2014) define a community of care as a 'school culture in which students and teachers care about and support each other, individuals' needs are satisfied within a group setting, and members feel a sense of belonging and identification with the group" (p.3). While our teachers take an interest in the well-being of all of our students and work diligently to support them during their transition to high school, their desire to form such a community of care specifically to support ninth-grade students is impacted by the lack of space in the current building which prevents the ability to schedule all ninth-grade students into ninth-grade academies /teams.

The vision for the ninth grade in the new school is to create a ninth-grade neighborhood to promote a supportive community, or a community to guide students during the transition from middle school to high school. This would include an area of the school designated specifically for ninth-grade classes with close proximity of classrooms for core academic classes that would allow for teaming and cross- curricular sharing and designated collaborative space to successfully deliver the curriculum and support ninth-grade students during their transition to

Doherty Memorial High School. Teachers would be able to utilize a team-approach by sharing the same caseload of students allowing them to build stronger bonds with ninth-grade students and offer a range of supports.

All ninth-grade students take the core academic subjects in addition to required elective courses. The typical ninth-grade schedule includes English I, Algebra I or Geometry, Biology, World History II, World Language, Physical Education (0.25 credits), Introduction to College and Career Readiness (ICCR), and (0.25 credits) Arts elective/other additional core electives.

As part of a ninth-grade academy, students and teachers will benefit from close proximity of grade-alike courses and shared collaborative space within sightline of classrooms, designed to facilitate break-out sessions, foster cross-curricular sharing and study as well as support interdisciplinary project-based learning. Such common areas will support such opportunities and allow for shared presentations and collaboration among teachers and classes. These areas need to be able to support a distributive model for technology (Chromecarts) and opportunities for students to publish (both in print and digitally) and present materials.

Teachers from each content area, working in grade-alike Professional Learning Communities (PLCs) can focus on their particular group of shared students and plan engaging and rigorous instruction while reviewing data and identifying academic, social/emotional, and behavioral issues of their shared students. Within this collaborative space there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

In order to support the ninth-grade team as part of the transition program, there will need to be ease of access to other school support services and flexibility to grow and change these spaces as enrollment and student needs change. Flexible office space than can be used to house an administrative and other support staff will help to support the program and foster a community of care for the students (Ellerbrock & Kiefer, 2010; Ellerbrock & Kiefer, 2014).

The proposed ninth-grade academy will be able to utilize the school's bell schedule but will have the flexibility to combine classes for programming opportunities. The break-out spaces should be large enough to allow multiple classes or a team to meet for presentations for both students and their families and have appropriate technology (Epson boards, document cameras, sound system, etc.) to support such programs and presentations. The classrooms should have collaborative doors to allow for team teaching and integration of subjects. Additionally, each area of this part of the building will need appropriate heating/ventilation and natural light to provide a welcoming and productive environment. Students will need access to lockers within the academy to allow for ease of access during their time in their core academic classes. The ninth-grade academy will house classes for the core academic subjects and therefore should be located between the humanities and the STEM neighborhoods to allow for vertical articulation and collaboration in each subject area.

Advanced Academy

In January 2012, during his inaugural speech, Mayor Joseph M. Petty announced a goal of establishing an exam school in Worcester as part of his educational platform. Subsequent to that speech, Mayor Petty appointed an Ad-Hoc Committee, chaired by School Committee member Tracy O'Connell Novick, and comprised of other school committee members, higher education partners, community partners and parents. This Ad-Hoc Committee was charged with studying "the feasibility of establishing an exam school for students in Grades 9 to 12 which would develop and promote academic excellence relevant to success in the 21st century." They spent several months researching, studying and visiting exam schools, and researching available curricula and programs such as the International Baccalaureate and Project Lead the Way programs, as it formulated recommendations to be presented to Mayor Petty and the Worcester School Committee. Additionally, several public hearings were held throughout the time.

In June 2013, the Ad-Hoc Committee recommendations were forwarded by the Worcester School Committee to the Superintendent for consideration in the creation of a proposal to establish a high school option for high achieving students. Since that time, the Worcester Public Schools Superintendent and Senior Leadership Team members have reviewed those recommendations and conducted additional research resulting in a proposal for "A Pilot Innovation Academy for Worcester Public Schools."

As indicated in the Statement of Interest (SOI), and in the Request for Designer Services (RFS), the Advanced Academy was initially proposed (Fall 2013) to be housed at Doherty Memorial High School but due to lack of space, this did not occur. At the time, this program would have involved an additional 250 students and would require ten classrooms dedicated to advanced academics for the Worcester district. If there had been additional space at Doherty, it would have provided a central location for students from all areas or the city in a location that did not cost the district any additional monies in rental agreements.

While Massachusetts leads the nation in most educational indicators, it is virtually silent on the identification and education of gifted and high achieving students. Worcester Public Schools has been on the forefront of academic programming for these students. Specifically, the Goddard Scholars Program serving gifted and high achieving students from across the district at Sullivan Middle School and South High Community School. The Goddard Scholars Program at Sullivan Middle School is one of the district's first innovation academies. The teachers in that program have expanded their knowledge of and implementation of pedagogy and best practices in gifted education. The Arts Magnet Pathway from Worcester Arts Magnet School to Burncoat Middle School to Burncoat High School has developed students with gifts, talents and interests in the visual and performing arts for many years with state and national recognition of their performances, productions and artistic creations. Across the district for gifted and high achieving students, Worcester Public Schools offers 23 Advanced Placement Courses to students. Additionally, our students are able to earn college credit through dual enrollment opportunities with local colleges and universities.

It should be clearly noted and understood that this Advanced Academy is not designed to replace or supplant any of the existing programs serving gifted and high achieving students. Rather, the Academy will be an additional option within the Worcester Public Schools portfolio of school and program offerings. The district will continue strong support for and enhancement of those existing programs.

Doherty Memorial High School, and the Worcester Public Schools, is poised to begin implementation of the Advanced Academy through communication and outreach efforts starting in the district's middle schools. In addition to core academics, students throughout Grades 7-12 in the Advanced Academy will enroll in coursework focusing on the biomedical and biotechnological sciences. The target population is students who have demonstrated exceptional interest in and an ability to be successful in a rigorous high school program of studies leading to advanced college readiness. The Academy will attract students from throughout the City of Worcester and will enroll 50 students per grade, for a total of 200 students from across the district. Students would apply while in Grade 6. Accepted students would join together to form a cohort, and this group would matriculate to a common middle school (Forest Grove Middle School), which is the primary feeder school to Doherty. This cohort would take core academic courses, and an introductory science course within this Biomedical Sciences sequences. This cohort would remain together in Grade 8, and then all would move on to Doherty Memorial High School for ninth grade.

School and district personnel within the Advanced Academy would review all middle school students' academic records and invite students who receive Advanced in both English and Math on the MCAS in Grade 6 to apply to attend the academy. This is similar to the other programs in the district, including the Goddard Scholars program a South High Community School and the Hanover Academy at Burncoat High School. Beginning in the 2022-23 school year, 50 students will be accepted from all areas of Worcester, including but not limited to the Doherty quadrant.

The district will create an admission set of criteria, an application, and a process for selecting and notifying students. The admissions criteria will include:

- A completed application

- A review of academic grades from the student’s seventh and eighth grade transcripts
- MCAS and/or other state assessment scores
- Transcript/grade report showing courses enrolled in and completed in middle school
- Student essay
- Teacher recommendation from one core academic teacher
- Attendance history
- Other criteria, if any, that the district deems necessary.

The application process will be coordinated by the district and Advanced Academy Assistant Principal, and applications will be reviewed and scored. Should the number of eligible students oversubscribe the number of available student slots, a lottery will be held.

The Advanced Academy, in addition to Massachusetts general education course requirements and college and career readiness skills, will incorporate and deliver a coherent curriculum focusing on the biotechnology and biomedical sciences. Labor Market trends from Central Massachusetts, statewide, as well as from national databases all demonstrate an increasing need for qualified employees. Further, there are numerous entry points to the Biomedical and related fields based on the students’ level of education, including Associate’s and Bachelor’s Degrees.

Advanced Academy – Biomedical Curriculum Focus - Occupational Projections
Table 3

Central Massachusetts Employment Projections – STEM and Related Occupations, Executive Office of Labor and Workforce Development					
Occupation	Employment 2016	Employment 2026	Percent Change	Typical Education needed for Entry	2018 Mean Annual Wage
Chemical Technician	168	170	+1.19%	Associate’s Degree	$57,829
Biological Technician	296	319	+7.77%	Bachelor’s Degree	$43,311
Medical and Clinical Lab Technologist	784	880	+12.24%	Bachelor’s Degree	$61,876
Medical and Clinical Lab Technician	166	181	+9.04%	Associate’s Degree	$43,824
Microbiologist	166	175	+5.42%	Bachelor’s Degree	$85,279
Biological Scientist	195	216	+10.77%	Bachelor’s Degree	$72,822

In Worcester alone, Biomedical- and Biotechnological-related industries have increased their presence. Support from local post-secondary schools demonstrates a strong current and healthy outlook for future needs. For example, in 2010 Worcester Polytechnic Institute (WPI) completed the development of their Gateway Park – a facility blending research, studies, innovation, and industry. Within this multi-facility park, WPI designed and implemented a Biomanufacturing Education and Training Center, as well as a Life Sciences and Bioengineering Center. In addition, several private industries have established sites within the complex. In 2006, Dr. Craig Mello, of the University of Massachusetts Medical School, was awarded the Nobel Prize for his work in Medicine and Physiology. This accomplishment heightened local attention to this growing field. Assumption College offers degrees in Biotechnology and Molecular Biology, Quinsigamond Community College provides Associate's Degrees and Certification trainings in several related fields, and many other area colleges offer similar programs and coursework.

The Advanced Academy sequence of courses will blend district-developed courses with nationally recognized providers of rigorous and innovative curriculum: Project Lead the Way (PLTW) and the College Board's Advanced Placement (AP) Program both offer curricula and resources that emphasize the utilization of information and skills from the classroom to a career. The Advanced Academy courses focusing on the biomedical and biotechnological sciences will be available only to students accepted into the program.

Doherty currently offers a Biochemistry course to students in Grades 11 and 12. From a review of post-secondary degree programs and related coursework, as well as identifying common preferred skills for those seeking employment in biomedical and biotechnological fields, the school will be working with secondary, post-secondary, and industry professionals to design additional course offerings to ensure students are appropriately prepared for their entry into college and/or into a career. These courses will likely focus on genetics, gene editing, immunology, microbiology, laboratory skills, and a strengthening of the existing biochemistry coursework. As a result of this partnership, the goal is for students to see practical applications of this work through learning opportunities within the community.

Project Lead the Way's Biomedical Sciences (BMS) Curriculum Program is designed for secondary-level students and engages students in learning content and activities relating to human medicine, bioinformatics, cell biology, genetics, disease and other biomedical topics. The BMS program offers a sequence of three foundation courses and ends with a capstone course. These courses are designed to support and enhance Doherty's core science course offerings.

There is a strong programmatic alignment between PLTW and the College Board. Curriculum sequencing within the Biomedical Sciences program align and mutually supports Advanced Placement Biology and Chemistry courses. The PLTW courses emphasize applied learning and provide foundational coursework and learning activities to introduce students to the field. In

Grades 11 and 12, the specialized PLTW courses focus on knowledge and skill development for entry to college and careers. The AP courses, and associated exams, provide additional opportunities for advanced coursework, as well as college credit.

As part of the MassCore graduation requirements, all students in the Worcester Public Schools must complete a minimum of three laboratory-based science courses. The majority of students, to ensure college and/or career readiness, enroll in a science course each year. To successfully offer this advanced Biomedical Science coursework, students in each grade will be enrolling in an additional laboratory-based science course. For example, students in Grade 9 will take Biology, the traditional first-year course offered to all students in Doherty. This course engages students in rigorous learning experiences, lays the foundation for subsequent coursework, but also prepares students for the MCAS exam. Ninth- grade students accepted into the Advanced Academy will also enroll in the PLTW Principles of Biomedical Sciences course. By participating in this course of study and by engaging in college and career readiness activities throughout this program, these students will be well-prepared and knowledgeable about the many opportunities in this field in terms of college majors and employment opportunities both locally and globally.

Often, students enroll in one science course per year. During the 2018-2019 school year, 102 students enrolled in two or more unique science course offerings. With the inclusion of this Biomedical Science program, 50 additional students will be taking two laboratory-based science courses simultaneously. This added enrollment will necessitate an additional science laboratory, and associated storage and preparatory spaces. Each of these BioTech/Biomedical Science courses will be designed for 1 credit, or the equivalent of a 1-period, full-year course. Advanced Placement Biology and Chemistry courses, due to the rigorous laboratory work embedded within their respective curricula, are 2 credit courses, requiring 2 periods of instruction each year. Therefore, at full enrollment Doherty expects to run an additional 12 periods of science instruction each year. With a seven-period day, the implementation of the Academy will necessitate an additional two dedicated laboratory classroom spaces. One of these laboratories will be utilized for advanced coursework in anatomy and physiology and will be supported by the inclusion of at least 2 Z-Space, or virtual dissection tables. These state-of-the-art AR/VR devices provide industry-level training and skill development and avoid the necessity of dissection specimens.

The Academy-related science classrooms and laboratory spaces would ideally be situated within the science cluster: there is no necessary adjacency to another program or space within the building.

Students in the Academy will benefit from shared enrollment in the other general education courses at Doherty Memorial High School, such as Mathematics, English, Social Studies, etc. In addition, Academy students will have access to the range of other elective and required courses including Physical Education, Health, Arts and a range of Advanced Placement courses.

B. Class Size Policies

Doherty Memorial High School follows the class size and teacher course load policies set by the Worcester Public Schools. Each teacher has a maximum of 125 students in his or her caseload which consists of the combined total of their five classes with an average of 25 per the negotiated teacher contract. During the 2018-19 school year, the average class size at Doherty Memorial High School was 22.2. However, during the same school year there were 451 classes with over 25 students enrolled in them and 27 courses with enrollments of 30 or more. Some programs, such as the Engineering and Technology Academy (ETA) are impacted by the class size and space requirements for safety reasons. As a result, the number of students who are able to participate in the ETA at each grade level is capped at 100, following the Career Vocational Technical Education (CVTE) guidelines.

The National Science Teacher Association safety guidelines recommend no more than 24 students in a laboratory setting at one time. Another guiding document – the STEM Learning Design's Review and Recommendations of Best Practices for K-12 STEM Learning Spaces report – also recommends a maximum of 24 students in the laboratory. In addition, the Worcester Public Schools contract designates a maximum teacher load of 125 students, and all teachers are assigned 5 teaching periods, resulting in 25 students per class. All classes will be scheduled with safety recommendations in mind.

Class Size Data for Doherty for Core Academic Subjects for 2018-2019

Table 4

MATH	**Average Class Size**	**# Classes**	**# Students**
Algebra 1	24.09	11	265
Geometry	24.68	16	395
Algebra 2	28.08	12	337

Statistics	23	1	23
AP Statistics	28	1	28
Pre-Calculus	26.6	8	213
Calculus	25.5	2	51
AP Calculus BC	30	1	30
AP Calculus AB	20	1	20
SCIENCE	**Average Class Size**	**# Classes**	**# Students**
AP Biology	25.33	3	76
AP Environmental Science	28	2	56
AP Physics 1 (AP Physics 2)	24.66	3	74
Biology 1	24.11	17	410
Biology 2	24	4	96
Biotechnology	25	1	25
Chemistry	24.3	13	316
Physics	26	4	104

Human Anatomy	26.8	10	268
Social Studies	**Average Class Size**	**# Classes**	**# Students**
World History II	23.68	16	379
US History I	25.68	16	411
US History II	27.3	13	354
Psychology	25.8	5	129
Sociology	15	3	45
AP World History	11	1	11
AP US History	25	2	50
AP Psychology	21.66	3	65
AP Human Geography	24.75	4	99
AP Government and Politics	23	1	23
ENGLISH	**Average Class Size**	**# Classes**	**# Students**
English 1	20.05	18	361
English II	22.4	17	381

English III	27	14	375
English IV	23.6	13	307
World Language	**Average Class Size**	**# Classes**	**# Students**
Spanish 1	15.25	8	122
Spanish 2	20.06	15	301
Spanish 3	19.75	8	158
Spanish 4	19.5	2	39
AP Spanish	17	1	17
French 1	25	2	50
French 2	13	2	26
French 3/4	10	1	10
Latin 1	17	2	34
Latin 2	16	1	16
Latin 3/4	8	1	8

Class Size data for the Worcester Public Schools

Table 5

All Classes 2017-18			
Grade Level	Avg Class Size	# Classes	# Students
PK	15.2	77	1167
K	18.9	928	17519
1	25.9	560	14505
2	27.3	532	14521
3	25.9	511	13231
4	24.1	483	11649
5	28.2	470	13241
6	15.5	19	294
7	19.5	177	3450
8	19.0	805	15256
9	19.6	223	4366
10	14.5	779	11285
11	14.0	696	9768
12	13.5	1008	13567
88	8.9	64	570
99	9.1	284	2592

English, Math, Science, Social Studies, Foreign Language, Arts, CTE and CVTE Classes			
Grade Level	Avg Class Size	# Classes	# Students
PK	14.6	66	963
K	17.4	655	11418
1	25.9	480	12431
2	27.3	456	12446
3	25.9	438	11339
4	22.1	414	9155
5	24.3	402	9751
6	18.3	13	238
7	18.8	150	2823
8	18.2	715	12993
9	19.8	175	3461
10	15.2	591	8979
11	15.3	543	8323
12	14.9	755	11274
88	8.9	64	570
99	12.0	158	1894

District	19.3	7616	146981

District	19.4	6075	118058

Additional course offerings are impacted by the lack of available classrooms. In order to offer additional courses to support college and career readiness in the global community, we would need both additional teachers and classroom space. While some classroom space needs to be specific to the course offerings, such as science courses or Career Vocational Technical Education, (CVTE) courses, other additional classroom space needs to be flexible in order to adapt to changing course needs and to support future changes in the curriculum frameworks.

C. School Scheduling Method (including Advantages and Disadvantages)

The school day begins at 7:20 a.m. and ends at 1:43 p.m. and includes a traditional seven-period day. The scheduling process is completed through a collaborative effort between the administration and the guidance department. Periodically throughout the year, the guidance staff meets with students to discuss their academic programming. Each spring, counselors work with students to complete the course selection process for the upcoming year. Attention is given to areas of student interests, college and career goals, and graduation requirements. Beginning in the 2018-19 school year, the course selection process was done electronically but in previous years had been done on paper and then the data entered into the computer program. By having the students complete this part of the process electronically in the portal, families can review and discuss the selections together and adjust accordingly. The courses are then approved by the counselor to be sure that they are consistent with all grade level requirements. This way, the data can be uploaded directly to formulate course tallies without data entry errors. Course tallies are used to determine the number of sections of each course to be offered and every effort is made to accommodate students' requests for courses. The scheduling program used by the Worcester Public Schools allows for flexibility as the process evolves, including allowing us to do batch scheduling changes and to link courses through Mass Schedule Edit feature.

The difficulty we face in the scheduling process is available classroom space to accommodate the courses and number of sections we need to offer. The school is overcrowded, and the facility does not support the needed academic programming. Room utilization is at nearly 100% for most spaces throughout the day. The classrooms used for the Special Education classes are too small to use for most other courses or purposes and some courses are being taught in spaces for which they were not intended. For example, art is being taught in a converted home economics classroom. Science is being taught in rooms that are not equipped for labs. Additionally, 50% of the teachers travel from room to room to teach their classes and noble attempts are made to limit the distance in order to avoid adversely affect teaching and learning.

Doherty calculated the room utilization rates for each department, for general and special education, and for the school. In this calculation, we considered every space available, even those classrooms that provide instruction through an open-concept approach. For example, one of our classrooms (room 212) is subdivided into three spaces (212A, 212B, 212C) even though all are within the same class area. This subdivision of additional classroom space is due to the severe overcrowding within the current building.

With nearly 100% room utilization, we are not in a position to easily add staff to our existing building, and therefore must maintain careful supervision of caseloads, class sizes, and contractual agreements. A disadvantage for our school is that the SAGE (Student Attendance Grading and Enrollment) program allows for each counselor and administrator to make changes to a student's schedule. This can be problematic forcing us to monitor these types of changes. At times we must follow a one-student-out / one-student-in policy in order to adhere to the teacher caseloads as prescribed by the negotiated contract.

Room Occupancy Information (2018-2019)

Table 6

Department	# Assigned Classrooms	# Available Periods of Instruction	# Instructional Periods used by department/assigned personnel	# Instructional Periods used for other departments, coursework, scheduled sessions	Combined Usage Rate per day
Math	11	77	64	9	73/77 = 95%
Social Studies	10	70	64	4	68/70 = 97%
World Languages	7	49	43	4	47/49 = 96%
Art	2	14	14	0	14/14 = 100%

English Language Arts	10	70	61	5	66/70 = 94%
Science	10	70	62	3	65/70 = 93%
Computer Science	2	14	11	1	12/14 = 86%
CVTE Engineering Technology	4	28	20	5	25/28 = 89%
Gymnasium	1	7	7	0	7/7 = 100%
Health	1	7	5	1	6/7 = 86%
Music/Theater	2	14	14	0	14/14 = 100%
Miscellaneous	3	21	17	3	20/21 = 95%
EL	2	14	10	4	14/14 = 100%
School Usage Rate for Classrooms able to hold a general education sized classroom				431/455	94.7%
Special Education	9	63	53	0	53/63 = 84%
School Usage Rate for classrooms with a layout able to accommodate 5-15 students				53/63	84%
School-wide Classroom Usage Rate, All Students/Courses				484/518	93.4%

With the 2019-2020 schedule, the room utilization pressures have increased with the addition of new staff members and the increased student enrollment. Within the current space, there are 76 total classroom spaces, albeit several rooms are really subdivided spaces within a single classroom space. Of these 76 rooms, 9 are designated as SPED spaces. 67 therefore are general education spaces, which includes science, health and physical education, art, CVTE programming, and core and elective programming. During the 2018-2019 school year, these spaces had a 94.7% utilization rate, and this was based on a maximum population of 1,529 students. ~~Of the 64 general education classrooms throughout the school, these are utilized 98% of each school day, an increase from 94.7% from the prior school year.~~ The school utilized non-traditional classroom space for four periods throughout the day, including the utilization of the library (3) and the auditorium (1) due to scheduling demands. The school also assigned five sections into the cafeteria, as there were limited, or no, available classrooms for those respective periods.

The student population is expected to increase by approximately 150-180 students. As each student needs 7 classes per day, this translates to, at a minimum, an additional 42 instructional periods of core and elective instruction (150 students x 7 periods ÷ 25 students per section). 42 instructional periods correlates to 6 full classroom spaces (42 spaces ÷ 7 periods) at a minimum. As we understand the MSBA space summary template, there are 80 non-SPED capacity generating spaces. With the increased student population and commensurate increase in course offerings, Doherty estimates the room utilization rate as follows:

During the 2018-2019 school year:

- 67 general education classroom spaces
- 7 periods of potential utilization; 67 x 7 = 469 instructional periods available utilization rate of 94.7% = 444 instructional periods taught within the general education classroom spaces.

Within the PDP proposal for the new building:

- 80 general education classroom or capacity generating spaces proposed
- 7 periods of potential utilization; 80 x 7 = 560 instructional periods available
  If we assume current scheduling (444 instructional periods) and factor in the minimum addition of 42 instructional periods, then the total minimum instructional periods being run will be 486

This creates a utilization rate within the general education spaces of approximately 86.7% (486 ÷ 560). In reality, there will likely be more than 42 additional periods created due to the increased population, and each additional period will increase the school's room utilization rate.

In addition, when compared to other schools, Doherty is currently understaffed for its student population. Doherty is unable to grow current programming due to lack of space; average class sizes, counselor ratios, etc. are comparatively high; and many classrooms are inadequately sized and provisioned. When planning for the new school, Doherty's proposal seeks to remedy these issues by offering additional programming, hiring additional staff, ensuring all classes - general and special education - are taught in appropriately sized classroom, etc. Currently, there are many special education students who receive a range of services, as well as are included within the general education classroom(s) to varying degrees. Each year, the numbers of students in full or partial inclusion change. The Space Summary template as well as the adjacency diagrams included within the PDP demonstrate the flexible orientations that will be possible as special education classrooms are integrated into the core academic spaces.

The advantages of having a scheduling program within the database written by members of the district and specifically for our district is that the modules, reports and overall program can be customized to meet the needs of our district and of the individual schools within the district. A committee, composed of several individuals across the district and led by the Manager of Instructional Technology and Digital Learning, is currently reviewing other options for scheduling and database management products to determine how to best support the needs of the district as one disadvantage to our current program is that many commonly used, industry standard programming packages (e.g. PowerSchool) more readily interface with the varied sources of student and school-wide data (e.g. standardized exam results from the CollegeBoard, or the ability to import/export information into Naviance, the college/career planning platform) and that many commonly used, industry standard programming packages provide a singular interface for all stakeholders to access information including grading and progress reporting and to facilitate communication between groups (e.g. student-to-teacher, teacher-to-parent, school-to-family).

The vision for the new school is to continue to use the district high school bell schedule which consists of a seven-period day, so every class meets every day. While our previous bell schedule included a rotating extended block to support learning activities that may have benefitted from additional class time on a six-day rotation, the new schedule has been implemented across the district beginning this school year. This recent standardization of bell schedules has allowed district-wide participation in Early College and Dual Enrollment opportunities for students in all of our high schools. The plan is to continue to utilize the district scheduling program while other options are explored by district personnel. Additionally, all Grade 9 students will be scheduled into ninth-grade teams to support their successful transition to high school as described in detail in the grade configuration section of this document.

In 2016, at the onset of the MSBA process, the proposed enrollment for Doherty Memorial High School was set at 1,670 students. This figure was determined as a result of a collaborative analysis of enrollment projections and space capacity needs for the Doherty Memorial High School project. This enrollment figure was based on demographic trends, as well as the recognition that Doherty has one vocational program.

As design work continued, and as more community and varied stakeholder input was gathered, for example through a series of school and community member visioning workshops, the community's desire to grow the curricular and college/career programming options available to students became evident. After much stakeholder input, from a review of current district educational program offerings, and with a thorough labor market analysis, the school is including within this design a proposal to add three vocational programs as well as an advanced academy with a curricular focus on the biotechnology/biomedical sciences. These four additional programs would be open to all students from across the district.

Doherty currently offers a vocational Engineering Technology program. This program was certified 10 years ago, and all Worcester residents are eligible to apply. Each year, the school admits students from across the district, including some entering the public schools from the area's private and parochial options. Enrollment figures for the 2019-2020 school year are representative of this pattern. Of the 370 students currently enrolled in Grades 9-12, 57% of these students reside in the Doherty quadrant and, theoretically, would be eligible to attend Doherty based on their home address. The remaining 158 students are 'out-of-district' and, without the benefit of the vocational program, would be assigned to their home school.

When the enrollment projections for the project were determined, the committee took into account the existing vocational program (Engineering Technology) as well as anticipated population trends across the city. After planning sessions, visioning exercises, and community input, the committee has included the three additional vocational programs and the advanced academy, all of which are available to students from across the district. There is a possibility that there may be greater student interest in Doherty and/or the available programming than expected. If so, then the student population could surpass 1,670.

The three additional vocational programs, along with the Advanced Academy, will similarly be available to all Worcester residents. It is reasonable to predict that a comparable percentage of 'out-of-district' students will be admitted to these programs. Due to concerns about overpopulation, the district has decided to reduce the enrollment of the new vocational programs that are held during the school day without changing the space summary specifications.

- Programming and Web Development: Program enrollment is estimated at ~~200~~ 160 students. If 43% come from outside of the Doherty quadrant, this represents an estimated additional ~~86~~ 69 students being served within the new building.
- Construction Craft Laborer: Program enrollment is estimated at ~~150~~ 120 students. If 43% come from outside of the Doherty quadrant, this represents an estimated additional ~~65~~ 52 students being served within the new building
- Marketing, Finance and Management: Program enrollment is estimated at ~~200~~ 160 students. If 43% come from outside of the Doherty quadrant, this represents an estimated additional ~~86~~ 69 students being served within the new building
- Advanced Academy: Program enrollment is estimated at 200 students. If 43% come from outside of the Doherty quadrant, this represents an estimated additional 86 students being served within the new building.

In total, if estimating similar enrollment patterns, the new Doherty would accommodate an additional ~~323~~ 276 students. With the current added enrollment of 158 students from the Engineering Technology program, there is potential for an additional ~~481~~ 434 students. This does not account for the students applying for, and receiving, special permission, which allows students to obtain a voluntary transfer and to enroll in the general education programming at our school from a different "home school" within our district.

In planning for the future, the school will have the capacity to increase the student population within these programs. Similar to the Innovation Pathways Program, the school would have the capacity to offer course offerings for students after-school hours.

Admittedly, it is difficult to predict the application figures for these new programs. However, the school administration is mindful that students are always able to attend their home school, which is the school assigned to them based on their current home address. There is a subset of Worcester students who can attend Doherty Memorial High School through the voluntary transfer process without applying or being accepted to any of these vocational programs or the advanced academy.

Therefore, design elements of this Feasibility Study reflect an expected enrollment larger than the stated figure of 1,670 students. For example, the cafeteria seating area will certainly be overcrowded if designed for a capacity of 557 students (1670¸ 3 seatings). For the purposes of this Feasibility Study, the cafeteria's capacity should more likely be 675 students for each seating.

D. Teaching Methodology and Structure

Doherty Memorial High School maintains high expectations for all learners while providing them with academic and social-emotional support needed for success in school and in life. The school is guided by its mission and core values and uses its focus statement to support student learning.

Mission Statement

Doherty Memorial High School empowers students to become critical and independent thinkers as well as life-long learners. We encourage diversity and creativity as we partner with our students and their families, our teachers, and our community to provide an education in a safe and caring environment.

Core Values

Academic Values

- Thinking critically
- Thinking independently
- Responding thoughtfully
- Practicing life-long learning skills
- Applying creativity

Civic and Social Values

- Appreciating diversity
- Partnering with students, families, and community members
- Working within a safe and caring environment

Focus Statement

Doherty Memorial High School is implementing a school-wide effort to demonstrate measurable growth in students' ability to read critically and respond thoughtfully in writing as evidenced by progress on external measures, such as the MCAS and the PSAT, and internal measures, such as Star and other common assessments

Doherty Memorial High School is a comprehensive high school. The faculty/staff is organized by academic departments: English Language Arts (ELA), Science, Mathematics, Social Studies, Career Vocational Technical Education (CVTE) Programs, Music, Art, Special Education, World Languages, Guidance, Physical Education (PE), and Administration. Faculty members meet by department to plan instruction, engage in professional learning opportunities and collaborate in Professional Learning Communities (PLCs) within these departments or grade-alike groups. Additionally, some teachers of elective classes (Art, Music, PE, Marketing, and Health) meet within one of the departments, or participate in similar monthly meetings with district-level personnel.

Most departments are assigned a set of classrooms for their primary use, and as such most classrooms within a department are located in proximity to each other. There are several 'departmental' classrooms that are not located near the other classrooms in their department due to the layout of the building, along with the limited classroom spaces.

Doherty has a CVTE Engineering Technology program that includes two grade-level, interdisciplinary teams (Engineering, Mathematics, Social Studies, Science, and ELA), one for Grade 9 and the other for Grade 10. The Grade 9 team, and the associated departmental classrooms, are located in proximity to one another and near the engineering classroom and laboratory space.

While there are a few areas in the current facility that have air conditioning it is important that the new facility have proper heating and cooling capabilities throughout the entire school in order to support optimal teaching and learning.

Administration/Academic Organization/Structure

There is one principal and there are four assistant principals, each with approximately 400 students in their caseload. One assistant principal is assigned all students in the CVTE Engineering Program as part of his caseload along with a portion of the comprehensive school population. All other students are assigned alphabetically to the other assistant principals. These administrative offices are located in two areas of the building. Two assistant principals' offices are located on the first floor near the principal's office and the guidance office. Two other assistant principals' offices are located in a second administrative suite on the third floor in order to maximize effective supervision and safety procedures.

The vision for the new school is to place administrative offices for the assistant principals in locations that will support effective supervision of students and close proximity to programs within the school. Maintaining the current administrative suite format (two assistant principals in separate offices with a shared space for a shared administrative support personnel and supervised areas for students) in two areas of the school. These shared spaces need to have a designated place for meetings with students, parents, and counselors. Each individual office needs adequate space for meeting with students and parents and access to technology. An area designated for the administrative support personnel needs to have access to technology and serve as a welcome center for those visiting the administrative offices.

With the projected increase in enrollment and the expansion of course offerings in the new building there is a need to increase the number of assistant principals to meet the needs of the growing enrollment and the diversified programming including the additional vocational pathways, the Grade 9 teams and the Advanced Academy and to be more consistent with the district's administrator to student ratio. The administrative offices will need to be located throughout the "neighborhoods" to support the students and staff and to increase opportunities for collaboration. It is important that all leaders are also active learners and continuously seek to support and engage in professional learning communities and school wide improvement efforts along with the faculty. Additionally, at least one school adjustment counselor will have an office adjacent to each assistant principal pairing in order to support the district's focus on promoting student resilience and to support social-emotional learning and proactive problem solving. The increased community use of the new facility, coupled with the level of after school programming that will be afforded to the school community will result in the need for additional administrative coverage beyond the regular school day and the school year.

Curriculum Delivery Methods and Practices

At Doherty Memorial High School, we believe in the 4 C's: critical thinking, communication, collaboration, and creativity and we have designed and implemented learning experiences for students that integrate all four of these areas, despite having a facility that does not support these activities in the manner in which it should. We also subscribe to the importance of rigor, relevance, and relationships. In our decennial report, the NEASC visiting team described the relationship between and among the adults and the students as a true strength of the school.

Teachers at Doherty Memorial High School employ a variety of instructional methodologies in their classes to deliver the curriculum. Guided by the Worcester Public Schools High Quality Teaching and Learning document they engage in practices that include whole-group and small group-instruction, modeling, and fostering opportunities for student-centered academic discourse and collaboration. The school is also guided by the Focus Statement and associated student-friendly strategy DHS SCORES (Decode- Read the question carefully, Highlight the tasks and terms, Stop-What is being asked?- Start to answer the question, Compile evidence and information, Organize your thoughts on paper, Respond thoughtfully in writing, Edit and review your work, Scoring higher equals success) to support critical reading and thoughtful writing in all classes across the curriculum. Teachers are increasingly integrating project-based learning into their curriculum to provide students with real-world learning experiences and to support college and career readiness. Programs such as the ETA regularly engage students in interdisciplinary learning activities that are highlighted during several learning fairs during the school year.

All classrooms and common spaces will enable staff, students, and outside personnel to utilize standard presentation and communication technology. Standard technology includes Epson bright link short throw projector, document camera, LED display is desired with screens that support both independent and mirroring displays; Chromecast/apple TV and speech reinforcement for classwork displays, announcements, etc.; standard Ethernet ports and wireless hubs providing varying degrees of access; and telephone capacity enabling calls between rooms along with connections to outside lines. These align with all stakeholder needs identified during the various listening and visioning sessions, including community members who imagine how outside organizations could benefit from the communal spaces.

English Language Arts

The mission of the English Language Arts program in the Worcester Public Schools is to provide a balanced approach to literacy to empower students to think critically and strategically, communicate effectively, and fully support arguments. Students read, comprehend, and critique a range of complex texts and media, write and present for various audiences and purposes, and develop habits of reading for enjoyment. This supports the school’s focus to read critically and to respond thoughtfully in writing.

Doherty Memorial High School offers a variety of full year (1 credit) and semester (0.50 credit) courses in English Language Arts (ELA). The current 1-credit ELA course offerings include English I-IV, Academic Literacy I -IV, Journalism I-II, Advanced Placement English Language and Composition, and Advanced Placement (AP) English Literature and Composition. During the 2018-2019 school year, there were four sections of AP English scheduled, serving a total of 78 students. All are scheduled as a one-period block.

All students in the school are enrolled in an English course every year, as four years of ELA is a graduation requirement. Students may take additional ELA courses based on interest (Journalism, Creative Writing, Theater) or need (Academic Literacy). Creative writing is a semester-long, 0.50 credit course that was added to the course offerings during 2018-19. Theater I-IV has been a part of the ELA department in past years. There are plans to grow the theater program as part of the expanding performing arts program beginning in the 2019-20 school year with the addition of a dedicated full-time theater teacher. Additionally, as part of the Early College High School program (Appendix 2), the English department, in conjunction with Quinsigamond Community College will offer English 101/102 on the Doherty campus as an additional way to support college and career readiness and provide students with another opportunity to participate in more advanced coursework while earning college credits.

The English department has sixteen teachers and ten classrooms dedicated to ELA instruction. In total, these staff provided a combined 66 instructional periods of English and general electives. With only ten rooms available in the area designated for the English department teachers often have to travel between rooms for classes. Elective courses such as Journalism, Creative Writing and Theater are scheduled into available classrooms, and therefore are often located outside of the area of the building dedicated to the English department. For the 2018-2019 school year, these 10 ‘English’ rooms had a combined usage rate of 94% (66 used periods out of 70 available periods). With the addition of new staff members next year, we will be faced with additional challenges when scheduling English classes within the current departmental space and will be forced to increase the number of teachers who need to travel to a classroom to teach.

Most of the ELA classrooms are not designed to effectively support a 21st century integrated humanities curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. In addition, there were several other non-ELA classes scheduled into these rooms, due to the available space (e.g. Social Studies, World Languages). ELA classrooms are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. The available space in these rooms often make it difficult to arrange furniture to such classroom activities as whole-group Socratic Seminars or small-group project-based learning activities.

Curriculum in the ELA classes is delivered using a variety of instructional methodologies including but not limited to whole-group instruction and modeling and whole-group and small group discussion, and collaboration that supports the school’s focus on reading critically and responding thoughtfully in writing using AP strategies, Self-Regulated Strategy Development (SRSD),and Advancement Via Individual Determination (AVID) strategies. Classes utilize technology in a variety of ways including the use of video and audio to support critical response, document cameras for modeling and collaboration, and Chromebooks (Chromecarts) for research, collaboration, writing, and publication. While collaboration and project-based activities are incorporated into the lessons in the ELA department, limited classroom and collaboration /break-out space can impact the ease and frequency of use of these activities. For example, when multiple classes have joined together to participate in station rotation activities, these classes have had to move to larger areas such as the cafeteria which provides more space and more flexible arrangement of furniture.

The vision for the English Language Arts department space in the new school includes maintaining the department structure for Grades 10 through 12 and includes classrooms of standard size with natural light and appropriate heat, cooling and ventilation and communication doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the ELA curriculum and grow the programs at

Doherty Memorial High School. Collaborative space is needed to support increased opportunities for students to engage in the multi-stage/ multi-draft writing process and include opportunities for students and teachers to engage in conferring and collaborating as noted in the AP English Literature and Composition course description. Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to the support distributive model for technology (Chromecarts) assigned to each room and opportunities for students to publish (both in print and digitally) and present materials. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

As part of a humanities program, ELA classes and teachers will benefit from close proximity within the humanities neighborhoods and shared collaborative space with social studies and English Learner (EL) classes and teachers. This will foster cross-curricular collaboration and study as well as supporting interdisciplinary courses such as AP Research and AP Seminar (currently assigned to the social studies department). Such flexible collaborative space and cross-curricular sharing will allow for future expansion in these departments and allow the school to diversify and increase the elective course offerings in order to “foster deeper and broader subject matter exploration in areas relevant to student interests and societal needs” as indicated in the Worcester Public Schools’ strategic plan (14.)

Mathematics

The mission of mathematics education in Worcester Public Schools is to provide opportunities for all students to interpret and persevere in solving real world, complex mathematical problems using strategic thinking. Students will be effective communicators and collaborators who construct viable arguments and critique the reasoning of others in order to make decisions, draw conclusions and solve problems.

The Massachusetts Frameworks for Mathematics guides the work of the mathematics department and supports the development of the Mathematically Proficient Person of the Twenty-First Century. This proficiency requires students who are college and career ready in mathematics to demonstrate the academic knowledge, skills, and practices necessary to enter into and succeed in entry-level, credit bearing courses in College Algebra, Introductory College Statistics, or other technical courses. These standards provide for a course of study that prepares students for a science, technology, engineering, or mathematics career by providing pathways for students who want to pursue a mathematics-intensive career or academic major after high school.

Students who meet the standards are able to identify problems, represent problems, justify conclusions, and apply mathematics to practical situations. They gain an understanding of topics and issues by reviewing data and statistical information, develop reasoning and analytical skills, and draw conclusions based on evidence. Students need to be provided multiple opportunities to discuss math's relevance to everyday life, their interests, and potential careers.

John Hattie's research has identified teaching problem-solving as being an effective hinge point (0.68) to accelerate student achievement. The creation of the mathematics classroom and collaborative space, coupled with the project-based learning opportunities afforded by the STEM/STEAM adjacencies listed above will allow us to better prepare each of our students to become the Mathematically Proficient Person in the Twenty First Century.

Doherty Memorial High School offers full year (1 credit) and semester (0.50 credit) courses. The current 1-credit course offerings include Algebra I, Algebra II, Geometry, Pre-Calculus, Calculus, Algebraic Reasoning, Numeracy, Statistics, and Topics in Algebra and Geometry. In addition, there are 0.50-credit offering in MCAS (Massachusetts Comprehensive Assessment System) Math. The Mathematics department currently offers three Advanced Placement courses: Calculus AB, Calculus BC, and Statistics. All are offered as a one-period block. During the 2018-2019 school year, there were three sections of AP mathematics scheduled, serving a total of 78 students.

All students in the school are enrolled in a math class every year and four years of mathematics is a graduation requirement. Students may take additional math courses based on interest (AP Statistics or Financial Literacy), or need (Numeracy, MCAS Math). There are plans to grow the mathematics program by offering courses as part of the Early College High School program in partnership with Worcester State University and/or Quinsigamond Community College. This will provide an additional way to support college and career readiness and offer students an opportunity to participate in more advanced coursework, while earning college credits. Students taking an Early College or dual enrollment course will either enroll in the course during the day in lieu of a regularly scheduled mathematics course, and/or these courses may be offered during non-school hours.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently there are eleven rooms predominantly utilized by the mathematics department. Six of these classes are located within the same hallway-referred to as the "math wing", one is located within the ninth-grade CVTE program area at the other end of the 300s floor, to allow for programmatic adjacency with other core academic courses in the ETA. The remaining four mathematics classrooms are located in other areas of the building, based on where rooms could be allocated to the department.

All rooms used for mathematics classes are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. The rooms assigned to the math department vary in size and seating capacity. Several rooms utilize a large table with chairs, as this furniture was repurposed from other areas within the school as the student population grew.

The school is built into a hill and as a result, many of the classrooms on the "hill side" of the hallway are below ground level, making them more difficult to heat given our current heating system and causing excessive condensation and dampness in the hot weather.

The vision for the mathematics department space in the new school includes maintaining the department structure for grades 10-12 and includes classrooms of standard size with natural light and appropriate heating. This vision also includes additional classroom and collaborative space to successfully deliver the mathematics curriculum and to grow the programs at Doherty Memorial High School. These classrooms should include flexible spaces that facilitate collaboration and that can adapt and be changed as the curriculum changes. They should include furniture that can be reconfigured for group work and projects rather than the lab tables that are in some of the classrooms.

Epson projectors with more than one display area should be in each math classroom to facilitate the use of technology and a Chromecart should be assigned in each of the classrooms. The classrooms need to be planned with this incorporation of technology in mind and placement should allow for ease of efficient access and flexibility to support a variety of presentation and collaborative experiences.

We anticipate adding space and staff to the math department due to the projected increase in enrollment and the addition of courses such as Financial Literacy and Advanced Quantitative Reasoning to our current course offerings. The district, and school, are seeking to add staff due to expected enrollment increases and due to expanded course offerings. Recent changes to Mass Core have increased graduation requirements which directly impacts course offerings. For example, four years of mathematics is now required for graduation and as a result, there is a need for additional staff in order to offer courses to meet this requirement. Consistent with the goals of the Strategic Plan for Worcester, additional staff is needed in order to expand and to diversify the current course offerings, and to expand the Advanced Placement program. An increase in staff will allow us to moderate class size to adhere to district staffing ratios and to better serve the needs of all learners. Collaborative space should exist within the department to support the work of the PLC's and to ensure horizontal and vertical articulation and alignment. Additional information regarding projected operating costs, including costs associated with increased staffing, will be included in the Capital Budget statement.

In order to support the advancement of STEM/STEAM programs, the math and science departments will benefit from close proximity and shared collaborative in the STEM/STEAM neighborhood facilitate teachers of the same grade across these departments to implement interdisciplinary project-based learning to demonstrate the relationship between the academic areas and for students to have their learning reinforced in multiple contexts.
This area will provide collaborative space for students to share information gathered and the analysis of the data for their projects and labs for their mathematics classes as well as to present the results of their research and/or lab findings. Such collaborative space and cross-curricular sharing will enable future expansion in STEM/STEAM departments and allow the school to diversify and increase course offerings to support both student interest and need.

Science, Technology and Engineering

The Worcester Public Schools Science and Technology/Engineering (STE) program provides students with in-depth exploration of the standards identified in the Massachusetts: STE Curriculum Frameworks (2016). Support for classroom and after-school activities are enhanced through partnerships with area colleges and cultural, environmental, and scientific institutions. Doherty Memorial High School offers full year (1-credit) and semester (0.50-credit) courses. The current 1-credit course offerings include Biology, Chemistry, Physics, Biology II, Applied Physics: Introduction to Technology, Human Anatomy, and several non-vocational engineering-based courses taught by CVTE teachers. In addition, there are 0.50 credit offerings such as Forensics, an intensive Biology II course, and Environmental Science. The school also runs 5 AP science courses: Biology, Chemistry, Physics 1, Physics 2, and Environmental Science. All science courses have a laboratory-based curriculum.

The Science department currently offers five Advanced Placement science courses: Biology, Chemistry, Environmental Science, Physics 1, and Physics 2. Of these courses Biology, Chemistry and Environmental Science are each designed to be taught during a two- period block. During the 2018-2019 school year, there were eleven sections of AP science scheduled, serving a total of 275 students.

The curriculum in the Science department is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group instruction, modeling of strategies, procedures and experimentation, whole- and small-group discussion, collaborative activities, project-based exploration of topics, laboratory experimentation, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently there are ten rooms predominantly utilized by the science department. Most of these classes are located within the same hallway, though two classrooms are located in different wings of the building. Of these designated science classrooms:

- two have functional lab benches with available sinks, gas, and electric
- six have some variation on lab benches/tables, with one functional sink. These lab benches/tables serve as both a lab surface as well as the students' desk spaces.
- two are outfitted similar to a regular education classroom, with no sink, gas, lab station/bench, or access to electrical connections.

There is a storeroom that has been converted and dedicated to a chemical storage room which also serves as a chemical preparation space. There are two storage rooms located near this chemical storage room: one is a stockroom for the majority of the biology and chemistry equipment, the other houses the materials for physics and the non-CVTE engineering/technology-based courses.

Most of the science classrooms are not designed to effectively support a 21st century STEM curriculum. Rather, most rooms just have rectangular lab tables, as opposed to tablet-arm desks, and a sink at the teacher's desk.

DMHS has a seven- period day, with no rotation or dropped periods. Each classroom is then available for use for seven periods each day. Therefore, there are 56 instructional periods available in a room outfitted to some degree to support a science curriculum, with another fourteen periods available for science staff, though situated in a general education classroom. This is a total of 70 available periods in a 'science' classroom.

During the 2018-2019 school year, there were thirteen FTE staff members providing a combined 65 instructional periods of science. In addition, there were several other non-science classes scheduled into these rooms, due to the available space (e.g. AVID). For the 2018-2019 school year, these ten 'science' rooms had a combined usage rate of 92.8% (65 used periods out of 70 available periods). With the addition of new staff members next year, including one in science, we will be over capacity and will hold more science classes in general education rooms.

The number of available classrooms, combined with their physical layout and available equipment, create deficiencies that challenge the department's attempted delivery of a 21st century STEM education:

- In order to run laboratory activities, teachers often have to switch rooms. For example, if a teacher needs to use a lab space with available electrical outlets, he/she must coordinate with the teacher assigned to that room and identify day(s) where the classes will switch rooms. This switching of classrooms/lab space has a negative impact on instruction as it detracts from effective use of instructional time. This change of classroom environment also disrupts established classroom routines and access to classroom materials.
- Given that each room is used by 2 or more teachers throughout the day, and given that most classes are structured with rectangular tables serving as both lab benches and student desks, teachers are forced to break down or move the lab equipment/class activity materials at the end of each period only to have to set them back up when their next class enters. Teachers cannot leave the activity materials on the lab benches/tables as these double as the desks for students. This creates a loss of instructional time.
- The physical layout and lack of available utilities negatively affect the range of laboratory activity offerings. Teachers are able to plan for a wide range of activities, but can only choose to practically implement a subset of these-a subset that aligns with the limitations of the available utilities.
- The classrooms cannot support a renovation. For example, additional electrical outlets cannot be installed into most classrooms due to the school infrastructure being unable to handle the added load.
- Safety equipment is dated and impractical. Two rooms have emergency showers and eyewash stations. Six have hoses that are coiled and located solely by the main door, often behind desks and lab tables. The regular education classrooms serving as science rooms have no safety equipment, and again staff and students need to move rooms in order to engage in science-based laboratory activities.

As we move into the future, and recognizing the growing importance of a STEM education in providing college and career readiness skills, Doherty Memorial High School needs a facility that enables students to rigorously and authentically engage with the Massachusetts Science Curriculum standards, including the acquisition and development of laboratory skills and practices. A 21st century science education will rely on technology, flexibility, classroom space for students to work collaboratively, and laboratory space designed for a range of curricular offerings. Flexible, yet separated, classroom and laboratory space enables educators to utilize a wide range of instructional practices, including but not limited to discussion groups, direct instruction, peer-to-peer collaboration, demonstrations, virtual simulations, laboratory investigations, inquiry-based learning activities, personalized groupings, individual work, etc. These flexible spaces will support several variations of organization to address current and future needs. This includes Grade 9 teams, with Grades 10-12 pairings between departments: for example, the English and Social Studies departments would be paired, while Mathematics and Science would also form a departmental pairing.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

In 2018, the STEM Learning Design, LLC released a report outlining recommendations for the physical design and utilization of effective K-12 STEM learning spaces. Many of these recommendations have been adopted within recent new school designs, and the physical space considerations for science classrooms and associated spaces would likely adhere to the identified best practices within this report. For example, when designing the building space, Doherty would include such recommendations as ensuring that spaces 'support (a) comprehensive approach to health and hygiene as well as active STEM learning activities, including project-based learning.' (p. 19). Classrooms and associated spaces would include effectively designed storage options for student work, materials, classroom resources, etc.

Social Studies

The vision of the 2018 Massachusetts Department of Elementary and Secondary Education Frameworks for History and Social Studies is that students will be "educated in the histories of the Commonwealth, the United States, and the world. They will be prepared to make informed civic choices and assume their responsibility for strengthening equality, justice, and liberty in and beyond the United States" (p.9).

Doherty Memorial High School offers a variety of full year (1-credit) and semester (0.50-credit) courses in social studies. The current 1-credit social studies course offerings include World History II, U.S. History I-II, Psychology, Sociology, Legal Aspects, Advanced Placement (AP) World History, AP U.S. History, AP Psychology, AP Human Geography, AP Government and Politics, AP Seminar and AP Research. Criminal Justice is a semester-long 0.50 credit course.

Students are required to take a minimum of three years of history/social studies classes in order to graduate, and all students in the school are required to take World History II, U.S. History I, and U.S. History II Students may choose to take social studies electives and/or AP courses. Additionally, Students Involved in Their Education (SITE), a student internship program, has also been a part of the social studies department. Currently there are 10 rooms predominantly utilized by the Social Studies department. Eight of these classes are located within the same hallway-referred to as the Social Studies wing, and the other two are located within the ninth grade ETA program area. Teachers travel between classrooms during the day to teach their classes.

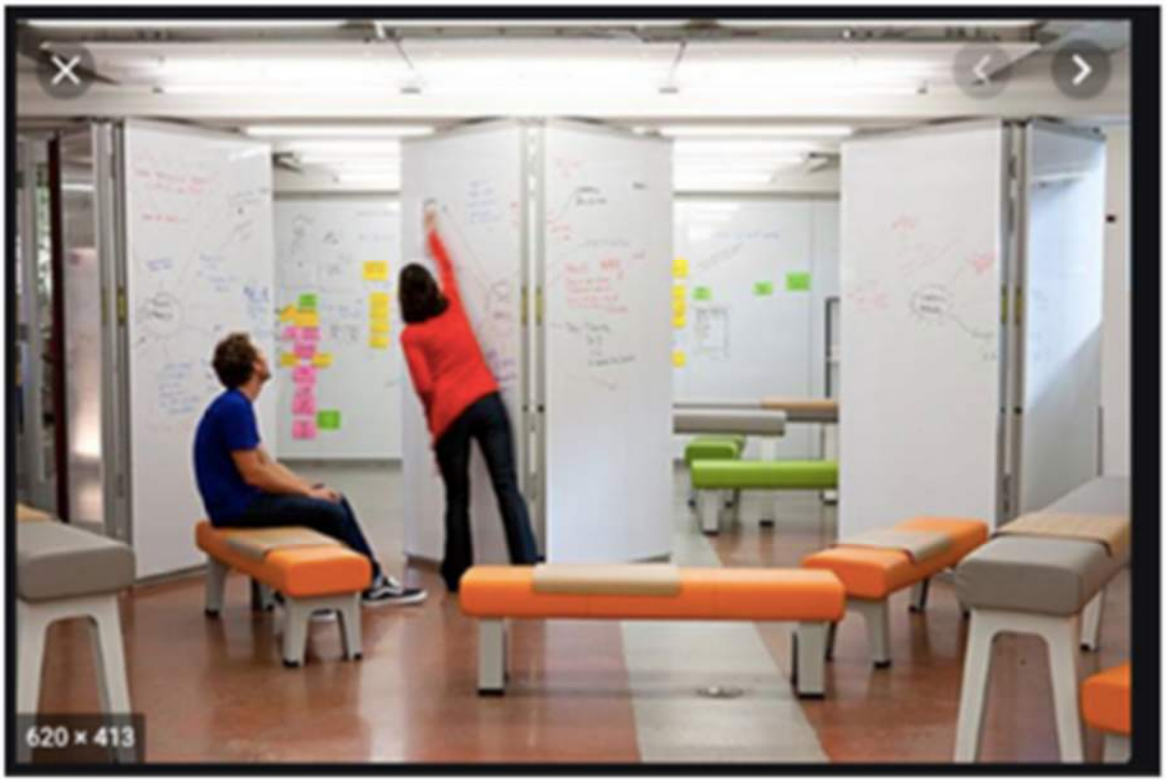
Each classroom is available for use for seven periods each day. Therefore, there are 70 instructional periods available in a room outfitted to some degree to support a social studies curriculum. During the 2018-2019 school year, there were 14 FTE staff members. Most teachers within the department provided social studies instruction, though several offered general, non-departmentalized elective courses as part of their assignment (e.g. AP Capstone courses, Internship Coordinator). In total, these staff provided a combined 66 instructional periods of social studies and general electives. In addition, there were several other non-social studies classes scheduled into these rooms, due to classroom availability at specific times of the day DMHS has a 7-period day, with no rotation or dropped periods. Each classroom is then available for use for 7 periods each day. Therefore, there are 70 instructional periods available in a room outfitted to some degree to support a social studies curriculum.

During the 2018-2019 school year, there were 14 FTE staff members. Most teachers within the department provided social studies instruction, though several offered general, non-departmentalized elective courses as part of their assignment (e.g. AP Capstone courses, Internship Coordinator). In addition, there were several other non-social studies classes (e.g. AP Capstone courses, Health, ELA) scheduled into these rooms, due to the available space. For the 2018-2019 school year, these 10 ‘social studies’ rooms had a combined usage rate of 97% (68 used periods out of 70 available periods). With the addition of new staff members to the department next year, and the addition of new courses, there will be a lack of available classroom space within the social studies wing, requiring classes to be scheduled in available rooms outside of the department area. As enrollment increases and the department continues to grow with additional staff and course offerings the school will be challenged to find appropriate classroom space to meet these needs.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion such as Socratic Seminars and debates, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis

Most of the Social Studies classrooms are not designed to effectively support a 21st century integrated humanities curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. All are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. One classroom (409) is only 730 square feet.

The vision for the social studies department space in the new school includes maintaining the department structure for grades ten through twelve and having classrooms of standard size with natural light and appropriate heat, cooling and ventilation as conversational doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the social studies curriculum and grow the programs at Doherty Memorial High School. Collaborative space is needed to support increased opportunities to support students to "learn to think critically, construct solid arguments, and see many sides of an issue—skills that prepare them for college and beyond" (AP U.S. History Course and Exam Description p.1). Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to support flexible use of technology (Chromecarts) and opportunities for students to publish (both in print and digitally) and present materials. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. These areas will allow for flexible orientations, and will have flexible furnishings to account for current and future needs. There are no specialized acoustical requirements beyond the acoustical classroom separations planned for the school. We anticipate using materials, for example whiteboard walls that pivot (see image below), that provide visual privacy when needed.



Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies. With the addition of an Internship/Community Service Coordinator position beginning in the 2019-20 school year, all student internships in the school will be developed and monitored by the coordinator and no longer supervised by a member of the social studies department as was the case historically. The coordinator will need a space to meet with students as a part of the new facility design.

As part of a humanities program, social studies classes and teachers will benefit from being in a neighborhood in close proximity and shared collaborative space with ELA and EL classes and teachers. This will foster cross-curricular collaboration and study as well as support interdisciplinary courses such as AP Research and AP Seminar (currently assigned to the social studies department). Such flexible collaborative space and cross-curricular sharing will allow for future expansion in the humanities departments and allow the school to diversify and increase the elective course offerings in order to “foster deeper and broader subject matter exploration in areas relevant to student interests and societal needs" as indicated in the district's strategic plan (14.)

World Languages

The goal of the Worcester Public Schools World Language program is to promote language proficiency in order for students to engage in meaningful communication and to appreciate cultures different from their own. This program is founded on the belief of the Massachusetts Common Core of Learning that all students should converse, read, and write in at least one other language in addition to English.

The mission of the World Language department states that at every level of world language instruction, students communicate will communicate in the interpretive, interpersonal, and presentational modes in the target languages. Students will gain an understanding of the target language and target culture by making comparisons and connections to their own language and culture and apply the skills and knowledge acquired in future career and life experiences.

Students must successfully complete two years of the same language in order to graduate from the Worcester Public Schools, with the exception of vocational students and some students with disabilities if their Individualized Educational Plan is written with that exception.
Doherty Memorial High School offers a variety of full year (1 credit) courses in World Languages including French I-IV, Latin I-IV, Spanish I-IV, Spanish Native Speaker, and Advanced Placement Spanish Language.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies and oral and written use of the target language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to research the culture and history of the countries associated with the target language and to practice speaking and listening skills using Audacity, a multi-track audio editor and recorder. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently at Doherty, world language courses are taught in seven classrooms, five of which are located in the world language wing on the fourth floor and two located in close proximity on the fourth floor. Prior to 2018-19, room 422 was a dedicated space, akin to a Global Learning Lab, used as a language lab for the World Language department. This space contained desktop computers and provided opportunities for classes to use Audacity program to support their speaking and listening skills in their target language. The desktop computers included specialized software to enable students to integrate technology as they engaged with the curriculum. Students were using the distributive technology to research the culture and history of the countries associated with the target language, to practice their speaking and listening skills using a multi- track audio editor and recorder computerized program, and to practice for and ultimately take the speaking component of the Advanced Placement Language (Spanish) exam.

Unfortunately, due to the overcrowding issues at the school this space has been converted to a classroom beginning in 2018-19 and is now used by various departments to provide much needed classroom space. While the loss of the Global Learning (computer) lab was offset by the purchase of Chromebooks, the Chromebook technology – due to software and hardware incompatibility – is not sufficient to enable all necessary curricular activities to occur.

The vision for the World Language department space in the new school includes maintaining the department structure and includes classrooms of standard size with natural light and appropriate heat, cooling and ventilation as conversational doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the World Language curriculum and grow the programs at Doherty Memorial High School. Collaborative space is needed to support increased opportunities for students to engage in speaking and listening activities such as plays, presentations, and cultural activities.

Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to support flexible use of technology (Chromecarts) assigned to each room and opportunities for students to publish (both in print and digitally) and present materials. These areas will allow for flexible orientations, and will have flexible furnishings to account for current and future needs. There are no specialized acoustical requirements beyond the acoustical classroom separations planned for the school. We anticipate using materials, for example whiteboard walls that pivot, that provide visual privacy when needed. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

Effective foreign language programs integrate the study of language with the study of culture which includes daily life, history, literature, visual and performing arts, mathematics, and science. In this way, foreign language programs create natural links to all other disciplines. As part of a humanities program, World Language classes and teachers will benefit from close proximity to the departments in the humanities. This will foster cross-curricular collaboration and study as well as supporting interdisciplinary courses.

The vision for the new school also includes expansion of the course offerings to include AP Spanish Literature and restoration of the Global Learning Lab to this department. A dedicated Global Learning lab, utilized primarily by the World Languages department, will provide increased opportunities for students to enhance their speaking and listening skills in their target language. If available, other classes requiring the available technology could certainly benefit from this space. The World Language Department Chair will be responsible for maintaining the schedule and coordinating the logistics of use of the space.

The world language teachers work to effectively meet the needs of our diverse community of learners using various instructional and assessment practices as they provide differentiated support to those who are new to the study of World Languages, Native Speakers and AP students alike. The addition/replacement of the language lab will greatly support their valiant efforts and help us celebrate the diversity of our community and as we learn about other cultures. The lab will be staffed by licensed teachers and the department chair will oversee the scheduling of the lab.

The use of student-centered Global Language lab activities and assessments supports the gradual release of responsibility as students develop target-language proficiency and confidence through authentic listening activities, listen and respond recording tasks, pair dialoguing, and interactive web-based activities. The lab will allow students to record and listen to themselves speaking in the target-language so they can learn to self-evaluate and self-correct. Students will have the opportunity to participate in engaging, project-based learning activities such as presentations, plays, and video projects.

The restoration of the Global Language lab will support student fluency essential for preparation for the AP exam earning the Seal of Biliteracy. The State Seal of Biliteracy is an award provided by state approved districts that recognizes high school graduates who attain high functional and academic levels of proficiency in English and a foreign language in recognition of having studied and attained proficiency in two or more languages by high school graduation. The vision for awarding this seal is to help students recognize the value of their academic success and for see the tangible benefits of being bilingual as is benefits college and career readiness. The MA Seal of Biliteracy, adopted from the state, takes the form of a seal that appears on the transcript and diploma of the graduating senior. This recognition may be presented to colleges and future employers.

Increased opportunities for student achievement and for students to take increased responsibility for their own learning are consistent with the emphasis on the gradual release of responsibility for students as they move through the years and is consistent with the skills needed for them to be lifelong learners.

English Learner Classes

The English Learner program in the Worcester Public Schools supports the implementation of Sheltered English Immersion with fidelity to promote English language acquisition by acceleration for all English learners in the district and to bring the opportunity of bilingualism/multilingualism to as many students as possible.

Doherty Memorial High School serves a diverse population of students who represent a range of native languages.

Table 7

2019-20 Student Counts by Native Language, ELL numbers		
Native Language	Students	ELL Students
English	709	0
Spanish	361	170
Albanian	88	7
Vietnamese	56	3
Twi	45	17
Arabic	41	24
Portuguese	34	18

Miscellaneous languages	29	6
Nepali	18	8
Swahili	17	8
Greek	12	0
French Patois	7	0
French	6	2
Russian	5	1
Rundi	5	2
Somali	4	2
Creoles & Pidgins (French)	4	2
Polish	3	0
Khmer/Khmai	3	0
Faroese	3	1
Haitian French Creole	3	3
Armenian	2	0

Kinyarwandu	2	1
Kongo	2	2
Ewe	1	0
Amharic	1	0
Urdu	1	0
Undetermined	1	0
Chinese	1	0
Tigrinya	1	1
Slovenian	1	0
Sango (Ubangi Creole)	1	1
Philippine (Other)	1	1
Persian	1	0
Ga	1	0
Ganda	1	0
Niger-Kordofanian (Other)	1	0

Creoles & Pidgins (Portuguese)	1	0
	1473	280

Doherty Memorial High School offers a variety of full year (1 credit) courses that support English Learners in an effort to support English language acquisition. The English Learners department has three teachers who provided a combined 15 instructional periods of language development and only two classrooms dedicated to EL instruction with one classroom on the fourth floor and one on the third floor. Teachers must travel between rooms for different class periods. DMHS has a seven- period day, with no rotation or dropped periods. Each classroom is available for use for seven periods each day. Therefore, there are 14 instructional periods in the designated EL classrooms. During the 2018-2019 school year, these two 'EL' rooms had a combined usage rate of 100% (fourteen used periods out of fourteen available periods). In addition, there were several other non-departmental classes scheduled into these rooms, due to the available space (e.g. Social Studies, ELA, Science). With the increasing enrollment of EL students, additional space is needed to provide instruction to support English language acquisition.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners as they develop English fluency. Instructional methods include whole-and small-group -instruction, modeling of and oral and written use of the English language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills While this is the goal in all classes in the ELL department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Neither English Language Learner classroom is designed to effectively support a 21st century language development curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. Both are laid out as general education classrooms comprised of a whiteboard, and tablet-arm chairs.

Curriculum in the EL classes is delivered using a variety of instructional methodologies including but not limited to whole-group instruction and modeling, and whole-group and small group discussion and collaboration that supports the school's focus on reading critically and responding thoughtfully in writing. Classes utilize technology in a variety of ways including the use of video and audio to support critical response, document cameras for modeling and collaboration, and Chromebooks (Chromecarts) for research, collaboration, writing, and publication. The school works to advance the mission of the Worcester Public Schools Office of English Learners “to support the implementation of Sheltered English Immersion with fidelity to promote English language acquisition by acceleration for all English learners in the district and to bring the opportunity of bilingualism/multilingualism to as many students as possible.”

The vision for the English Learner department space in the new school includes additional classroom and collaboration space to successfully deliver the EL curriculum and grow the programs at Doherty Memorial High School to meet the needs of the many English Learners in the school. Collaborative space is needed to support increased opportunities for students to work in peer groups and in small groups with a teacher to engage in academic discourse, reading, writing, and presentations to support their language acquisition. Students will benefit from close proximity to the ~~English and Social Studies neighborhoods~~ core academic classrooms/neighbors to allow for shared collaborative space and opportunities for modeling, EL support and which will help to increase equity and access to other courses in ~~the humanities~~ all core academic departments.

College and Career Readiness

Beginning in the 2018-19 school year all grade 9 students are required to participate in a ten-week course focused on college and career readiness, earning 0.25 credit upon successful completion of the course. The lessons in the Introduction to College and Career Readiness course incorporate lessons from Naviance and are designed to assist students in creating and maintaining a plan for their individual and personal educational plans or MyCap. The lessons include time-management exercises, self-awareness activities, interest inventories and college and career exploration lessons.

Beginning in the 2019-20 school year, all grade 10 students are required to participate in College and Career Readiness II and will earn 0.25 credit upon successful completion of the course. The lessons for the tenth-grade students represent a continuation of the introductory course and increase the breadth and depth of these exploration activities and support the further development of their individual plans for high school while increasing each student’s knowledge of postsecondary options based upon their career interests.

Academic Support Programming Spaces

Doherty Memorial High School provides a variety of academic support programs for students during the school day as well as after school and on Saturdays. Students enrolled in the courses such as Academic Literacy, Numeracy, AVID, and Study Skills participated in these classes during the school day. After-school classes and Saturday workshops are available throughout the year and to support students to prepare for the English, Math, and Science MCAS exam. Additionally, AP students participate in Saturday practice exam sessions at different points in the year to help them prepare for the end-of course AP exam.

Academic Literacy

Academic Literacy I-IV is offered to provide a double dose of English to support students with identified needs. In this course, offered through the ELA department, students learn to appreciate the varied reasons for reading; discuss texts as a community of readers; and apply comprehension strategies to academic texts. Students engage in activities that increase or improve reading comprehension, reading technique, vocabulary acquisition, and general literacy skills.

These classes are currently taught by members of the ELA department and are located in the ELA wing, as space allows. The vision for the new school is to continue to offer these classes in grades 10-12 ELA neighborhood and to locate Academic Literacy I classes in or within close proximity to the Ninth-Grade Academy.

Numeracy

Numeracy is offered to provide a double dose of math to support students with identified needs. In this course, offered through the Mathematics department, students strengthen foundational math skills and increase their understanding of Algebra I by addressing properties of rational numbers (i.e., number theory), ratio, proportion, estimation, exponents and radicals, the rectangular coordinate system, formulas, and solving and graphing linear equations and inequalities.

These classes are currently taught by members of the Mathematics department and are located in the Mathematics wing, as space allows. The vision for the new school is to continue to offer these classes in the Mathematics neighborhood as well as within close proximity to the Ninth-Grade Academy.

Advancement Via Individual Determination (AVID)

The Worcester Public Schools supports the implementation of AVID’s (Advancement Via Individual Determination [AVID])mission to close the achievement gap by preparing all students for college readiness and success in a global society. Doherty Memorial High School offers full year (1 credit) and a semester (0.50 credit) courses Advancement Via Individual Determination (AVID) Elective course. AVID I-IV are 1 credit courses and AVID 1 Pt. 1 is a 0.50 credit course. Most students enter the high school AVID program in the ninth grade and stay in the program through graduation.

AVID supports students who are motivated and have the desire to excel and attend college but need additional support (academic, social, and emotional) to prepare them to be college and career ready. Many of the students are the first in their family to attend college and/or are members of groups that are often underrepresented in higher education. Students in the AVID program participate in the AVID Elective course each year. During the 2018-19 school year the semester-long AVID 1 Part 1 course was offered in order to provide these valuable academic and collaborative skills and supports to students who are not in the AVID Elective courses/AVID program (AVID).

Collaboration and the ability to utilize flexible grouping is an essential part of the AVID curriculum. “Students would rather talk, move around, and ask questions than sit still and be quiet. Humans are wired to construct knowledge through action. AVID classrooms promote motion, communication, and team building through activities such as Socratic Seminars, Collaborative Study Groups, peer tutoring, and Philosophical Chairs. These activities honor the way students learn best” (AVID).

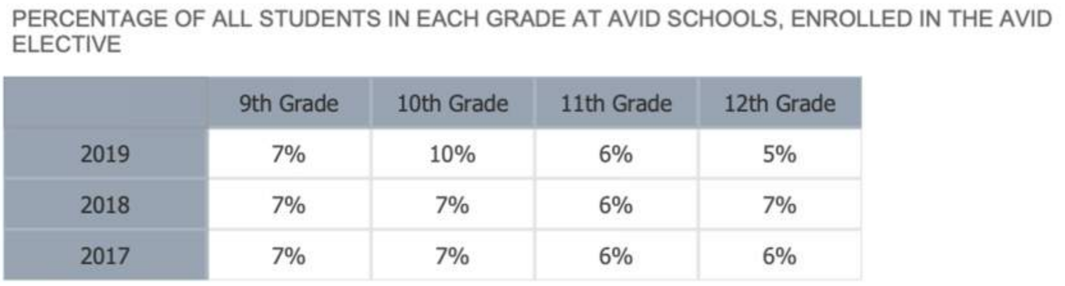
Each week, AVID Elective students participate in collaborative study sessions (tutorials) in which they use critical thinking, collaborative inquiry, and academic discourse skills to explore and solve Points of Confusion (P.O.C.) from different academic content areas. Students receive additional support during this process from AVID tutors. These tutors are community volunteers. Generational tutors are community members, often retirees, who volunteer their time and their expertise to help guide students through the tutorial process. In addition, AVID programs in the district partner with colleges in Worcester and to provide additional tutors to support AVID students. This combination of tutors provides students with varying perspectives and the opportunity to interact with members of our community.

The AVID program requires and benefits from community-based tutors. Like all other visitors, these tutors will be permitted access to the building through our main office entry and will be permitted access to the AVID classroom only. The school currently implements protocols regarding visitor access, including parent/guardian(s) and other community members. These protocols limits visitor access to the room (office, classroom, etc.) applicable to their visit only.

In addition to classroom space for whole group instruction and frequent guest speakers, the AVID classroom is arranged to provide small group collaborative work areas in order to support the tutorial process every Tuesday and Thursday, the current classroom configuration limits the ability to successfully create these collaborative spaces. Students currently use small white boards to present their P.O.C. and furniture must be rearranged for each group for each session. The AVID curriculum also includes instructional methodologies that promote reflective academic discourse and AVID classes frequently participate in activities such as Socratic Seminars, Philosophical Chairs, Gallery Walks and other whole-class participatory activities. An additional part of the AVID curriculum includes collaborative team building activities that often require space for student participation.

The vision for the AVID program space in the new school includes collaboration space to successfully deliver the AVID curriculum and grow the program at Doherty Memorial High School. Currently, there is only one designated classroom AVID classroom and due to the lack of available classrooms in the current building, there is a need to schedule other classes in the room when there is not an AVID class. This posed a challenge when the opportunity arose to add a section of AVID I Part 1 second semester and as a result of previous classroom scheduling this class this had to be placed in a science room that lacked appropriate spaces for the collaborative process. In order to successfully engage in collaborative inquiry, students need space to gather in small groups with tutors (the ideal student: teacher ratio is 7:1) complete with access to technology and white board space to post P.O.C.s and work through the tutorial process. Ideally, the AVID program would like to be able to serve at minimum, ten percent or our school population. The current lack of space impacts the ability to expand the program and to offer additional sections of AVID (Table 8). The ten percent of Grade 10 students served in 2019 is reflective of the addition of the AVID 1 Part 1 course but the students in that course had limited collaborative space. Only 51% of the Grade 10 students in AVID classes (either AVID II elective or AVID 1Part 1) were able to participate in AVID in a classroom with at least limited collaborative space.

Table 8



PERCENTAGE OF ALL STUDENTS IN EACH GRADE AT AVID SCHOOLS, ENROLLED IN THE AVID ELECTIVE

	9th Grade	10th Grade	11th Grade	12th Grade
2019	7%	10%	6%	5%
2018	7%	7%	6%	7%
2017	7%	7%	6%	6%

AVID strategies are not limited to the AVID Elective class. “The power of AVID Secondary is the ability to impact students in the AVID Elective class *and* all students throughout the campus. AVID Secondary can have an effect on the entire school by providing classroom activities, teaching practices, and academic behaviors that can be incorporated into any classroom to improve engagement and success for all students. Teachers can take what they've learned at AVID training back to any classroom to help all students, not just those in AVID, to become more college- and career-ready”(AVID). This link between AVID and professional learning opportunities for staff necessitates areas for collaboration, modeling, and access to the AVID library and resources for all staff members including members of the AVID Site Team. The ideal space would allow for space for modeling and co-teaching opportunities to support gradual release and effective utilization of AVID strategies to support academic success and promote college and career readiness.

Study Skills

Study Skills classes are offered through the Special Education Department to support students with identified needs. These year-long courses are taught by members of the Special Education department. (See full description in Special Education section.)

Student Guidance and Support Services

The mission and purpose of the Worcester Public School Guidance Counselor Department is to advocate for every student and provide a comprehensive guidance program that will assist all students in acquiring the knowledge and skills needed to become career and college ready. The program is based on the Massachusetts Model for Comprehensive School Counseling. School counselors take a systematic approach to deliver a standards-based curriculum to all middle and high school students through individual counseling, small group counseling and classroom guidance lessons to facilitate student learning and development in three domains: personal/social development, academic/technical achievement, and workplace readiness/career planning.

The Guidance Department houses staff members who provide a variety of support services to our students. In past years, Doherty has had five guidance counselors. Beginning in 2019-20, there will be six guidance counselors at DMHS to meet increasing enrollment and growing student need and to bring us closer to the American School Counselor Association and the Massachusetts School Counselors Association recommended ratio of students to counselor of 250:1. The number of guidance counselors will likely increase due to the projected increased enrollment in the new facility. These counselors work with students and their families to evaluate academic needs, refer students for evaluation and identify appropriate academic support, provide social/emotional information and provide short and long term counseling/support, communicate with families and assist with facilitating school-to-home/home-to-school communication, and support college and career readiness preparation.

Doherty has two full time school adjustment counselors, and one part-time school adjustment counselor who focus primarily on providing short- and long- term counseling and crisis intervention for students, act as liaisons between parents, students, and teachers regarding student needs, referring students for community-based mental health and counseling services, and monitoring student attendance. Additionally, there is a school psychologist whose responsibilities center on the assessment of students' academic, social-emotional and behavioral needs, communication with parents and community providers regarding student needs, and providing consultation to teachers and administrators regarding student needs.

Guidance counselors meet in both large and small groups in academic classrooms and in the Guidance Conference room to discuss topics related to college and career readiness. Counselors utilize Naviance, a college and career readiness program that allows students to create a personalized plan that helps them make the right decisions throughout their academic journey, as a tool which provides parents and students access to the portal.

The current Guidance Office has a counter in front of the guidance secretary's desk. The guidance secretary serves as a greeter for the department welcoming students, parents and college/career representatives, handles all incoming phone calls, helps to schedule appointments and visits in the office and organizes and tracks both current and past student cumulative records. Doherty also serves as the repository of the school records/transcripts for both Classical High School (the predecessor of Doherty Memorial High School) and Commerce High school. These older transcripts/records are currently housed outside of the Guidance Office, in the office of the Instructional Coach.

The central part of the Guidance office also contains a small conference table which serves as a waiting area for students, parents, and other visitors. Currently there are six private offices in this area that are used for three of the guidance counselors, the two school adjustment counselors, and the MassEdCo representative who is assigned to our school to work with students and families to support the college application and financial aid process. There is a small work area behind the guidance secretary that is used for guidance -related materials and the photocopier for the department. This is also used as access to the head counselor's office. The other two guidance counselors have offices in the guidance conference room. These offices have portable walls and do not allow for private meetings with students or parents. The conference room contains tables, arranged in an oval, and seating for fifteen people. This area is used for presentations, meetings with college/career representatives, parent meetings, and as a student workspace. While this space is flexible, it is not adequate for many of its intended uses. This conference area does not provide private/confidential space for meetings with parents or specialists. For example, Individual Education Plan (IEP) meetings, which involve Special Education staff, guidance counselors, administrators, and other support staff, are held in the conference area in room 309 (the administrative suite that houses two of the assistant principals' offices) because it ensures more privacy.

The space is not large enough for many of the college/career presentations that need to be scheduled or for whole-class lessons with guidance counselors. Additionally, there are no other spaces for teachers to meet with parents or to make phone calls to parents that provide privacy. This area is often used with students to engage in online college/career exploration utilizing Naviance or work on PLATO (online credit recovery program). With the addition of office space for the sixth guidance counselor beginning in August 2019, there will be even less space available for these purposes.

The vision of the Guidance Suite for the new school is to provide a central location for information, college/career explorations, advising and support. The vision for the Guidance and Support Service Office space in the new school includes private office space, classroom, meeting and collaboration space and a career center to successfully support student needs and provide programs to foster college and career readiness. The proposed Guidance Suite would benefit from proximity to the main entrance for ease of access to the office and services by families, college/ career representatives, and other support service providers. Additionally, adjacency to the other administrative offices will facilitate collaboration among different student supports.

This proposed Guidance Suite will include a welcome center within the front part of the suite with space for the guidance secretary to greet visitors, answer questions, and direct and monitor the flow of phone calls and foot traffic through the office. There is also a need for a waiting area with ample room to accommodate students, college/career representatives, and families. There is a need for flexible collaborative space that can be used for small- group meetings such as enrolling new students or parent-teacher conferences.

Each counselor will need an office which can allow for private meetings and be large enough to include students, parents, appropriate students support personnel, and an interpreter. While there will be six guidance counselors beginning in 2019-20 school year, the office needs to be flexible to accommodate any increase in staff that may be needed to support any increase enrollment and to allow the counselors to stay within the 250 : 1 ratio as recommended by Massachusetts Model for Comprehensive School Counseling.

Private meeting space is an essential part of the Guidance Suite in order to provide emotional safety for students and allow for confidential meetings with students, parents and support personnel. Flexibility within this suite will allow for expansion of these roles should they been required to meet student needs and enrollment. Additional private office/meeting space is needed for programs such as MassEdco which provides college and financial aid counseling to students and families.

The suite needs to be designed in a way that it promotes a sense of emotional security and is a safe space for all students with ease of access to counselors, resources and a place where they can regroup and refocus within visibility of counselors.

Flexible conference/collaborative space is needed for meetings and presentations by college/career representatives; a large conference room/presentation space with seating for 30-40 people and a smaller conference room/presentation space with seating for twenty people. Each space should be equipped with whiteboards, projectors and other appropriate technology. This space can also be used as instructional space to support the delivery of the curriculum as recommended in the Massachusetts Model for Comprehensive School Counseling.

During the course of the day, there is a need for multiple meeting spaces to accommodate the range of presentations that can occur simultaneously. Colleges visit the school and host information sessions for students during the school day. A large conference room which can accommodate 30-40 people will allow for these types of informational and instructional sessions within the school day. Additional group meetings such as IEP meetings, and team meetings such as the Graduation Improvement Team, Attendance Team, and the Instructional Leadership Team, meet throughout the day. These groups require a private meeting space that can accommodate these groups, which often have 15-18 members. Two separate conference rooms/meeting spaces will allow for these programs and meetings to occur simultaneously without limiting the instructional/informational opportunities for students. Due to current limitations, Doherty often does not host district-level professional development or district-based administrative meetings: flexible and variable conference and presentation space will allow Doherty to benefit from visitors and trainers.

When considering the use of these proposed spaces, and possibilities for shared usage, it was determined that the Guidance department can utilize the Career Center space for the 30-40 person meetings, but will require a smaller private conference space for 15-18 people. This will be reflected in the updated PSR Space Summary.

In all spaces, there needs to be reliable and consistent access to technology not only in each individual office area but throughout the entire suite to support the use of technology for activities such as MyCap (My Career and Academic Plan) and Naviance to support academic and career planning process, and PLATO The suite needs to include space with easy access to resource materials for students and access to technology/printing for applications, resources, and other similar materials.

Currently, many Doherty students participate in work-experience or internship placements. Doherty is planning for a dedicated space, designated as a Job Placement Office, for the staff member assigned to assist these students in their off-site placements, as well as to liaise with community members working with Doherty students. Doherty currently offers several credit-earning options for non-vocational students and so this office space is not intended exclusively for the Chapter 74 programs. For example, the SITE program (Students Involved in Their Education) allows students to leave school at the end of the day to participate in an unpaid internship within a local business or organization. Students with a job who complete certain requirements are eligible to earn credit and many of them work to help to support their families. The Job Placement Office established a common location for students, staff and community members to access information about these options and to utilize the support provided.

Students within the vocational programs participate in internship opportunities independent of the SITE or Work-Experience programs.

The Guidance Suite needs space dedicated to safe and secure storage of student academic records, including the repository of records that need to be stored and accessible at the school. The school is a repository for school records for Doherty, Classical High School (the predecessor of Doherty) and Commerce High School. In keeping with the intent of 603 CMR 23.06, the time limit for destruction of the record should probably be not less than sixty years and therefore appropriate safe space to archive these records needs to be included in the Guidance Suite.

Student Support

Health Center

The Worcester Public Schools partners with Family Health Center to operate a School Based Health Center at Doherty Memorial High School. As noted in the Family Guide and Community Resources document (Appendix D) “Health Centers are staffed by agency personnel as well as a WPS School Nurse and School Adjustment Counselor. The School-Based Health Centers provide students with necessary health care: physicals for school, work or sports; treatment of illness; first aid; emergency care; immunization and/or health education. In order to receive services from the partner health order to receive services from the partner health agency at the school, parents/guardians must complete and return to school a signed enrollment form. This is available at the school. When appropriate, health insurance companies of the families will be billed. No one will be denied services if unable to pay" (Family Guide and Community Resources, 2017, p.18).

Currently, the health center is staffed by two nurses and the School Based Health Center is staffed by a nurse practitioner, an administrative assistant and a behavioral specialist. The area within which they work is not large enough to adequately support this important function a school as large as Doherty. There is no private waiting area for students who are waiting to be seen by either one of the nurses or the nurse practitioner. There is insufficient space for the school nurses to make phone calls to parents or agencies about student's health issues. There are only two exam rooms and they are quite small in size with inadequate storage for medical supplies. The nurse practitioner, who is employed by Family Health, faces similar situations as she has only one small exam area within which to work and an office that barely fits one person. Despite these crowded conditions, during the 2018-19 school year, the staff of the health center saw and treated 1,253 students at least one time and the School Based Health Center, SBHC, staff had 4,000 visits, 3,100 for medical issues and 900 visits for behavioral health reasons and involving 398 students. During the 2018-19 school year, there were 750 students at the school who were members of the health center which represents nearly 50% of the school population.

The school nurses' responsibilities are extensive. They administer medication, evaluate students and staff who visit the health center, triage illnesses, injuries and health concerns and respond to medical emergencies throughout the school. The school nurses provide screening for height, weight, and BMI, vision and hearing, and they engage in Screening, Brief Intervention and Referral to Treatment (SBIRT), an evidence-based practices used to identify, reduce and prevent problematic use, abuse, and dependence on alcohol and illicit drugs. The nurses conduct these SBIRT screenings in the hopes of referring students who may be experimenting with drugs, alcohol, and/or have mental health issues to intervention programs. The school nurses collaborate with the district nursing department, other healthcare providers, and families to address the physical and mental health needs of our students.

The nurse practitioner provides additional treatment to students who are members of the School-Based Health Center, SBHC. She also works with families and other health care providers to meet the needs of our student population by conducting annual physicals to students and treating a variety of conditions. The behavioral specialist also employed by Family Health works collaboratively with our staff and students to help to address the mental health needs of health center members. The nurses and the SBHC staff maintain records and complete injury reports and other documentation to support our student's health and wellness.

The vision for the new school is to provide ample space for three nurses and the SBHC staff to complete their work. Due to the increased enrollment and the extensive use of this space, the number of nurses will increase from our current staffing of two to three. This area would include adequate exam room space, a waiting area that is large enough to avoid the spreading of germs, office space to be able to communicate with parents and providers while maintaining and respecting confidentiality and privacy issues about student's health issues and a small conference room to meet with families to discuss medical issues privately, and to be able to provide small group therapy and a lactation space for nursing mothers. Additionally, an increased number of bathrooms, including one to gather specimens, and one that includes a shower. This space should include a larger resting area, a break area for any student who needs to relax or those who may be dysregulated, and a space for diabetic students to test and to eat if need be according to their levels. There also needs to be a sufficient office for the administrative assistant to support the work of the nurse practitioner and multiple exam rooms for the nurse practitioner to treat students who are members of the center. The behavioral specialist needs a space to be able to meet with students that is large enough to support counseling services, to provide urgent mental health evaluations and to support ongoing therapy. There is also a need for additional storage in the health suite for medical supplies.

Additionally, despite our best-efforts to treat students at school, there are certain situations that warrant calling 911 and having our students transported to the hospital for more care and therefore, we request that there be access to the outside of the building that is handicapped accessible and near a driveway in order for Emergency Medical Services to be able to transport these acute cases of medical need to the hospital without having to travel with students on a stretcher and/or wheelchairs throughout the building. The nurse's suite and the gymnasium are areas that these types of emergencies seem to occur more frequently. An exterior entrance will also support the SBHC being accessible after school hours and possibly to other family members of our students and other members of the community should this expansion occur. There is a need for space in the health suite to incorporate a food pantry and a clothing outlet to better meet the needs of our students and their families. Historically, all clothing donations have been kept in an area of the guidance office and students have accessed a variety of clothing items for themselves and for their families. This space has been limited to one wardrobe closet. The adjustment counselors have distributed food and grocery gift cards to families particularly during the holidays but there is a need for a more consistent provision of food items than we have been able to address. In the new school, we envision a space for food and clothing distribution as a part of the health center. These areas will be maintained by our community partners, staff donations and service-learning initiatives.

E. Teacher Planning

Each teacher is scheduled for one preparation period each day. This provides teachers with the opportunity to design materials and plan instruction to support the delivery of the curriculum in accordance with DESE curriculum frameworks. Teachers utilize ATLAS, the district's online platform which provides access to curriculum frameworks, curriculum maps, curriculum resources, and other course-specific information to help with this work. In order to access ATLAS and to facilitate instructional planning teaches need a dedicated space with access to technology and other professional learning materials/supports. Currently there is a teacher workroom on the third floor which has a worktable for individual and collaborative work, as well as access to a telephone for teacher use. This workroom is flanked by two teachers' rooms each of which provide a small area for staff lunch and can also be used for teacher preparation space, however, access to this space is impacted during staff lunch periods. Teachers may also use the library/media center for teacher preparation, but this area is also used by individual students and by classes which can limit the availability of space for individual and collaborative work.

Members of both the Grade 9 and Grade 10 teams in the ETA meet two days a week for collaborative planning. This common planning time is built into their schedule as part of their assigned duty. Currently, they hold these sessions in room 200/conference room. Quite often, however, their meeting/collaborative planning session must be relocated in order to accommodate another meeting that needs to be held in the conference room. As a result, these teams must seek alternate space within the building.

When other PLCs need to meet they too must either try to book time in room 200 or seek an alternate location which will provide enough space and privacy the group to meet. As a result, PLC work and other opportunities for common planning time is often dictated by room availability.

The vision for the new school is to increase both time/opportunities and space for teacher collaboration. This can be accomplished by incorporating collaborative spaces into each academic area in each department as well as including shared collaborative space to allow for cross-disciplinary collaboration. Teacher workspace, equipped with worktables, access to technology and phones, and storage for planning / curriculum materials is essential to enable each teacher the opportunity to work both individually and collaboratively to design lessons to deliver the curriculum. These workspaces need to be flexible in design so as to accommodate changing teacher needs and to be able to be used for both individual and small- group professional learning opportunities.

These teacher planning spaces need to be located in close proximity to the various academic neighborhoods to foster collaboration by subject, team as well as allow for interdisciplinary sharing. Each department space needs to have a table and rolling chairs to allow for flexible seating to accommodate a variety of professional learning and collaborative activities. Individual teacher workstations with flexible furniture, including individual locking file cabinets and flexible seating will ensure every teacher has a home base from which to work and allow teachers to spend valuable time during their preparation period on planning effective instruction rather than trying to find space to work.

Professional development/ professional learning opportunities occur in a variety of ways at Doherty. Whole- group, small-group, and one-on-one coaching sessions and individual activities are used throughout the year to support the needs of our teachers, and ultimately to support the needs of our students.

Each year the principal, Instructional Coach, and the Instructional Leadership Team (ILT) review the data to identify areas of student need. With that in mind, this group identifies which topics/ to be addressed for all staff members, which areas are content-specific and will be addressed professional learning session by department, which areas will be addressed in targeted small-group professional learning sessions and which areas will be addressed in one-to- one professional learning/coaching sessions with the Instructional Coach.

Professional learning opportunities take place using several formats. Each year the staff participate in two full day professional development days. During these days there is a mix of whole-group professional learning, small-group professional learning, academic department professional learning, and individual teacher reflection. Additionally, each month there is professional learning sessions help as part of the principal's meeting and during department meetings. Whole-group professional learning is held in the school's cafeteria and small break-out sessions take place in classrooms.

Professional learning takes many forms including, but not limited to presentations, (video, and/or speakers) book studies, modeling successful strategies, ongoing analysis of multiple sources of data, whole and small- group discussion and reflection, as well as a variety of training sessions such as MCAS / SAT test administration procedures, ALICE training, technology and other safety/wellness trainings. During professional development days, department meeting days and other after- school sessions, small groups meet in available spaces such as classrooms, the library and the conference room (room 200). One-to-one coaching/professional learning sessions occur in the Instructional Coach's office or in individual teacher's classrooms. Technology coaching is offered by the school's two Google trainers and occurs where there is available space and access to technology.

While there are multiple opportunities for professional learning to occur throughout the year, the principal, Instructional Coach, and the ILT work to create a theme and establish connections between topics to link ideas and to create a web of professional learning that is applicable and supportive to all staff members.

The vision for professional development in the new building, as we move toward the academy and neighborhood model, will include expanding opportunities for teachers to meet in PLCs and increasing collaboration in PLCs in grade-alike groups/teams, vertical collaborative groups and cross-disciplinary groups. These collaborative and professional learning sessions will take place in the collaborative spaces located in the different "neighborhoods" associated with the academic disciplines (STEM/STEAM, humanities, arts, world languages, special education, etc.). With the addition of the Grade 9 academy, there will be increased opportunities to schedule common planning time for teachers who work with the same group of students. Additionally, with the creation of academic neighborhoods for core content classes for grades 10-12 there will be opportunities for grade-alike collaborative meetings by content area as well as by academic pairings (ELA and social studies, and math and science). The addition of collaborative spaces will provide places for these teachers to meet, something that is currently unavailable in the current building.

Within these spaces there needs to be appropriate technology to support professional learning and presentations and modeling of successful strategies. This would include being equipped with access to technology, printing, presentation equipment (projector, screen, sound, flat screen TV for video). Additionally, there needs to be shared collaborative space between the different neighborhoods complete with appropriate technology and presentation equipment (projector, screen, sound, flat screen TV for video) to provide both content- specific technology trainings and cross-curricular professional learning opportunities. Such shared professional learning/collaboration space could occur near the humanities departments, STEM departments, arts departments, health and wellness departments and counseling/administrative departments.

Professional learning is a continuous process and needs to be able to be delivered and allow for active participation in the various venues. Whole-group professional development opportunities require a large area with appropriate access to technology and presentation equipment (projector, screen, sound, flat screen TV for video). Both the cafeteria and the auditorium need to be designed to allow for professional learning presentations --access to technology, sound, presentation equipment (projector, document cameras, screen, TV

Professional learning also involved individual support and one-on-one and small group coaching. Doherty currently has one instructional coach. The vision for the new building is to provide a space for two Instructional Coaches (one for the humanities and one for STEM) where each coach can meet with small groups and in private with individual teachers. There needs to be a shared collaborative space for planning and presenting professional development complete with access to technology and presentation equipment (projector, screen, sound, flat screen TV for video) and access to whiteboards to model successful instructional strategies. There also needs to be adequate storage space for professional learning resources and materials for both the Instructional Coaches and staff members.

Assessment Coordinator

Students in Grades 9-12 engage in a variety of assessments to measure student progress. Assessments include Star assessment, PSAT/ SAT, AP assessment, ACCESS test for EL students and Massachusetts Comprehensive Assessment System (MCAS) assessment, which is a graduation requirement. The Assessment Coordinator, referred to as the MCAS Specialist currently works out of an isolated office on the first floor to keep secure test materials.

The vision for the new building is to provide a space for the Assessment Coordinator/MCAS Specialist to prepare test materials, review data and monitor/administer assessments that occur throughout the building. The area needs to have access to technology (desktop computer) that allows the coordinator to oversee online testing that occurs in classrooms. While many of our assessments are nor given electronically, there are still some hard copy test materials (student test tickets, paper test for students for which this is an accommodation in their IEP) that need to be secured. There needs to be space within this office to organize test materials and to meet with teachers and students to review data and test results.

Room Assignments

Currently, the assigning of rooms is difficult due to our overcrowded and outdated facility. Over 50% of the teachers in our school travel from room to room and although we attempt to limit the distance it is difficult to keep the traveling teachers within the department to which they are assigned. As mentioned throughout this document, some courses are being taught in rooms for which they were not designed, and others are simply too small for the number of students in our classes. The vision for the new school is to maintain the assignment of rooms by department with intentional adjacencies to support teaching and learning. Rooms dedicated to the ninth- grade teams, Special education and Chapter 74 programming will not follow the departmental or "neighborhood" room assignment methodology but rather will be integrated into "neighborhoods."

F. Lunch Programs

Doherty Memorial High School's current cafeteria includes approximately 4312 square feet, excluding the kitchen, food preparation, storage, and point-of-sale stations. There are 36 tables for student seating. During each seating, students enter through one of several identical serving lines. Each line operates similar to a cafeteria-style, where an employee serves the food onto disposable trays and places these trays on a stainless-steel serving station. Students move across the serving line and select their items, ending at the point-of-sale station operated by another cafeteria employee.

Per district policy, all students in the Worcester Public Schools are offered free breakfast and lunch each day. After making their meal selections, students enter their unique Worcester

Identification number at the point-of-sale station. If a student selects additional items during a meal, they are able to pay cash for these items.

The current Doherty Memorial High School cafeteria is situated at the end of the first-floor corridor. Students are able to enter and exit through a primary entrance, with a secondary entrance at the back of the cafeteria. At the start and end of each lunch period, there is a delay in dismissing students promptly as the limited number of exits, as well as the layout of the corridors and stairwells, hinders the timely flow out into the rest of the building.

The cafeteria space provides seating for students with bench-style, foldable, rectangular tables. The maximum capacity of these tables is approximately 432 students. With a student population well over 1500 students, and with 3 lunch seatings, the cafeteria is currently over capacity during each lunch period. Some students are able to each lunch in other supervised settings, including classrooms, the guidance area, administrative offices, and in the library, when available.

The hope with the new school construction design is to ensure adequate space for a third of the school population. The district-wide secondary-level bell schedule designates three lunch seating sessions, approximately starting at 10:45 a.m. with the last seating ending shortly after noon. The planned student population is 1670, however there will likely be far more students than what is anticipated. As introduced and clarified within the vocational and proposed programming sections, this design proposal is planning for a cafeteria to house up to 675 students at each seating.

Prior to the start of the school day, students are able to acquire breakfast from the cafeteria. Many students choose to select their meals and sit in the cafeteria space, while others elect to take their selections and head to their classrooms, lockers, or to meet up with staff and/or students. Cafeteria planning and delivery models are changing to reflect a ‘grab and go’ service style. Once the school day starts, students coming in late still need the opportunity to get breakfast. Therefore, there will be one ‘grab and go’ serving station available in the serving area that will remain open once the school day begins. This station will be structured to serve as a stand-alone, albeit smaller, entity that serves students at non-traditional times. For example, this stand-alone, self-sufficient station would serve students coming late to school, arriving after the starting bell and after the main cafeteria and kitchen closes as they begin preparations for the lunch service. In addition, this station would now provide opportunities for students, e.g. those participating in afterschool athletics or extracurricular events, to access nutrition in the later afternoon or evening. This stand-alone, self-sufficient station’s design will include a point-of-sale unit, handwashing infrastructure, a refrigeration unit, dry storage, a countertop heating cabinet, and will be kept secure via a rolling overhead door. This station will be accessible to students without needing to enter the main kitchen or main serving area.

The new cafeteria design will consist of one central kitchen and serving area adjacent to the student seating area. The design will enable proper visibility throughout both the serving and seating areas for supervisory purposes, and will have windows providing daylight throughout the space. During passing time, there will be multiple points of entry and exit, thus ensuring a steady student flow. The student seating areas will consist of several smaller, though connected, dining areas revolving around this central kitchen and serving area. The new school design has planned for 8350 net square feet for the cafeteria seating area. This space, while dedicated for breakfast and lunch time use, will be available as a multi-purpose space during non-meal time hours.

The student seating area will connect to an exterior dining area. This space will allow for overflow during the school day and would allow students to be outside during appropriate weather, but will also enable after-school activities, e.g. athletics, to access the kitchen space.

In order to provide the same access for staff to meals, a faculty cafeteria will be situated adjacent to this space. This space would occupy 200 net square feet and would contain a buffet-style adult service station, and would be structured with a single, linear serving line ending with a point-of-sale unit. One additional benefit of this space is that it would allow for other adults, e.g. school visitors, to have access to meals if needed, though the design is not intended for steady community usage. The faculty dining room will essentially provide the full range of cafeteria services and options through a reduced footprint. This station can be operated by staff members, and can provide meal options to students beyond the school day.

To facilitate ease of serving and to provide access to food during a teachers’ preparation period as well as to students who participate in after-school activities such as sports or drama rehearsals, etc. We are planning to include a robotic salad machine “Sally” by Chowbotocs. This robotic vending machine customizable, made-to-order salads, snacks, breakfast bowls, and grain bowls within a sleek 3×3 footprint, requiring minimal space in the cafeteria. No additional space is needed if the machine was not available. This machine, located in the faculty dining area will provide continued access to healthy snacks beyond the school day. The ingredients will be prepared by current cafeteria staff and menu items can be updated seasonally and could incorporate items that are grown in the school’s garden/growing spaces.

The proposed main cafeteria serving area will be based on a scramble-style service. This is a variation where numerous stations are arranged around the space, each serving different foods. The variation in menu selections, along with the expected student population being served on a daily basis, demonstrates a need for 5 serving stations within the serving area. Students would go from one station to another, and after making all selections they would then exit through one of several point-of-sale stations. One benefit of this scramble-style service is that students can move from one serving station to another without having to pass through an entire line offering choices of which the student will not select. Research indicated that a scramble style kitchen enables more students to be served in shorter periods of time. Within similar research, however, scramble style serving areas require more space than single line serving stations (Beasley, 1995).

The desired ratio is 75 students per point-of-sale station. The proposed design is planning for 6 stations. This figure represents a balance between the available staffing with the logistics of ensuring students are able to efficiently move through the serving stations and have sufficient time to eat. Typically, 80-90% of the school population cycles through the cafeteria serving lines.

In order to accommodate such a high volume of students during each seating, the scramble style serving area is planned for 3000 net square feet. This will be supported by a kitchen and preparation area adjacent to this serving area. The planned kitchen area would provide 3,146 net square feet and would include a Dry Prep area which is utilized for bundling nonperishable meals. The space can be used to prepare breakfast and lunch meals for Doherty as well as for distribution at other schools within the district that lack facilities and space. For example, the kitchen at another city high school, with allocated conditioned/refrigerated space is preparing salad and fruit servings that are then shipped to other schools across the city.

The kitchen space would include ‘pass through’ style doors, have central tables and food preparation, dry storage shelving around the perimeter, ovens and warmers, a dishwasher, and appropriate hand-, food-, and tool-wash sinks. The kitchen will also require a walk-in freezer and walk-in refrigerator. Each would be approximately 200 square feet, with 8-foot tall ceilings.

The refrigeration units and the dry preparation spaces should be in proximity to the loading dock or delivery area. This would allow for prepared food deliveries to be moved to and from the loading dock without having to travel through the main kitchen. Within the kitchen space, an employee office space will accommodate up to 6 workstations. These employees will utilize an adjacent locker room/changing area, including a lavatory and shower facility. A custodial closet, providing storage for cleaning supplies and related materials, will be accessible from all associated areas.

G. Technology Instruction Policies and Program Requirements

During the 2018-2019 school year, the Worcester Public Schools converted the majority of hardware and software to utilize the Google suite of products. Most staff members, including all teachers, were issued a Chromebook for their individual utilization. In addition, based on the school population, each school was allocated a number of Chromebooks and storage/charging carts for classroom utilization. Staff members are permitted to bring their Chromebooks home for lesson planning and preparation. With these devices, faculty members can access the Google G Suite of office applications, including Docs, Sheets, Slides, Drive, Calendar, and others. These applications provide similar features to the Microsoft Office products, i.e. Word, Excel, PowerPoint, etc.

In addition, the school has purchased numerous carts outfitted with a document camera and a projector. These are assigned throughout the building and are shared between all staff. These devices connect to desktop and Chromebook computers and are used by educators and students for instructional purposes. Some classrooms have a ceiling mounted projector, installed by Doherty staff.

Prior to this transition, Doherty relied primarily on desktop computers and traditional computer labs located throughout the building. Each classroom had a desktop for staff use, there were several generalized computer labs, including one in the library, others for general classroom use, and some computer labs were designed to support specialized curricula. Chromebooks, and the associated G Suite software, now provide typical general education classrooms with the ability to conduct research, perform word processing tasks, and design and implement presentations.

However, Doherty offers several courses of study and educational programs that require hardware and software that stretches the limits of the Chromebooks. Prior to the transition, therefore, each school was able to request and plan for their unique number of needed computer labs-labs equipped with more robust desktop computers that can operate specialized curriculum, including the computer programming, marketing software, and the varied engineering tools, e.g. AutoDesk, required in those courses. Each computer lab designed and/or retained in the school lowered the allotment of student Chromebooks that would ultimately be delivered.

The student Chromebooks are stored in moveable charging carts. These carts are stored throughout the building and are spread across each floor. The school administration created a digital calendar allowing staff members to reserve the carts for specific days and instructional periods. Each day, staff members will move these carts from one location to another based on this reservation system. With 73 classrooms and 24 carts, each cart is used daily.

Each Chromebook cart is assigned to a specific classroom for evening storage and charging purposes. This ‘home-base’ policy ensures that all carts are accounted for at the end of every day and that they are properly charged for use for the coming day. During a typical day, the period 1 educator who has reserved the cart will go to the home-base classroom and bring the cart to his/her classroom. The educator has a standardized sign-out log, where each student is assigned a specific Chromebook for usage. This is done to minimize the loss of instructional time in getting the Chromebooks to each student.

Part of the Worcester Public Schools’, and Doherty’s vision of a graduate and guiding principles is to graduate computer-literate students. Students coming to Doherty have unique and diverse background knowledge relating to their skill sets and technological proficiency. All staff, throughout the school year, plan lessons and learning activities where students will utilize the available Chromebook technology to engage with their respective curricula. Students conduct research, discuss and respond in writing to a variety of prompts, prepare and deliver presentations, etc. Effective with the 2018-2019 school year, Doherty is administering several standardized exams, including the MCAS exams, AP Spanish Language and Culture, and an internal diagnostic literacy and mathematical proficiency test, via the Chromebooks. To ensure that student exam scores reflect their respective level of curricular comprehension, as opposed to their computer-interface proficiency, staff plan lessons that enable students to learn the mechanics of using the devices prior to the exam administration.

Near the end of the lesson, the educator ensures students have saved their work, logged out, and returned the Chromebooks to the cart in preparation for the next period. This process takes several minutes of instructional time. At times, the cart will remain in the classroom for the incoming students, but often the cart will be moved to another classroom. Given the crowding in the extremely narrow hallways during transition times, educators often try to move the carts in the moments right before the dismissal bell, or in the moments right after the bell to start the next period.

The process then repeats with having students getting their assigned Chromebooks. In general, each cart is used throughout the day, and often each cart is moved from one classroom to another, and ultimately is returned to the home-base for evening storage. There are numerous carts on each floor of the building, approximately proportional to the number of classrooms therein.

With the transition to MCAS 2.0, the Chromebooks are used for standardized testing. Given the approximate size of the testing population, the majority of Chromebooks (21/24 carts during the spring 2019 MCAS administration) are reserved. Carts are reassigned to specific testing rooms for the exam administration days, and several are brought from other floors. Given that there is no elevator, carts are brought outside and wheeled through the parking lot to a doorway accessing the testing floor. This is done the day prior to the start of testing. This necessity reduces the availability of this technology for general classroom usage during exam administration.

The Worcester Public Schools, through their Office of Instructional Technology and Digital Learning, regularly offers Chromebook and G Suite training to all WPS staff. Recent trainings target novice, intermediate, and more experienced users, and include numerous offerings throughout the summer and school year: Beginning Google Challenges for Educators; Rethinking Lesson Planning with Digital Tools; and G Suite Accelerated Trainings are all recent offerings. Doherty has identified and trained, through this district office, several staff members to be 'Google Trainers,' or site-based personnel with more advanced knowledge so that he/she can provide more timely and personable support to the building personnel as each continues to improve their facility with the relatively new technology. Doherty, through its internal professional development opportunities and facilitated by the in-house Google Trainers, provides support for any interested staff members. This support happens through formal planned sessions, e.g. during a faculty meeting, but it also is provided informally through one-on-one conversations and requests for assistance from a staff member to the Google Trainer.

The Worcester Public Schools Information Technology (IT) Department services and maintains this technology. Staff devices, if damaged during normal usage or through expected wear and tear, are replaced with an equivalent unit. If a student Chromebook is damaged, it is sent to an administrator who submits a repair ticket to IT. A member of IT will collect the device and return it after repairs are implemented, usually within one to two weeks depending on the nature of the damage.

The Worcester Public Schools' Strategic Plan outlines the district-wide goals and objectives relating to technology and the students' development of technological skills. In part, the Worcester Public Schools ensures that "all students will have access to rigorous and personalized learning supported by technology." Technology certainly includes computers, Chromebooks, printers, projectors and other standard classroom devices, but also extends to curriculum specific tools. For example, the Doherty Science department utilizes TI Nspire devices within their laboratory activities, the Mathematic department provides opportunities for students to utilize the range of programs available with the more advanced TI Graphing Calculator series, and the World Language department utilizes programs that enable students to speak and record as they learn another language.

The Worcester Public School's Strategic Plan, through the Office of Digital Learning, has outlined a plan to provide 1:1 classroom coverage for all school for the start of the 2024-2025 school year. These Chromebook devices will be leased. As such, each classroom will require appropriate charging stations (standard 110-120V outlets).

The acquisition and utilization of educational technology is coordinated by the district's Information Technology Department. The responsibilities of this department include the maintenance and infrastructure support for every school and program in 55 locations. Further, the department supports:

- Over 1,500 computers, 14000 Chromebooks, and over 3,000 iPads;
- 75 servers, including file, domain, and backup servers;
- A district website with a content management system that allows schools, teachers, and administrators to modify their personal website;
- Cloud hosted email services for WPS employees and students;

- Internally developed and maintained student and employee information systems;
- Data analyst services providing data for research and evaluation purposes.

The district utilizes CIPA compliant web filtering, email archiving, backup data protection, fiber wide-area connectivity to all sites, and a 10 Gbps internet connection.

The IT Department, as part of the district's Strategic Plan for Education, has set goals and benchmarks to positively affect all schools, including Doherty. These goals include:

- The acquisition, implementation, and support of an updated student information system. Currently the district utilizes an internally developed system maintained by district employed programmers. The adoption and implementation of a commercial, industry-standard student information platform would provide additional features and benefits for families, students, staff and administrators at all levels.
- The improvement in wireless access in school buildings. The goal is to develop and maintain a robust wireless infrastructure to support a 1:1 device initiative throughout the district. The current Doherty facility offers three levels of wireless access, though coverage is constrained by the physical layout. In any new design, the campus will be equipped to offer industry-standard, up-to-date coverage throughout the entire campus.
- Address the digital divide outside of school. The goal is to improve after-school access to technology and the internet to support student learning.

The goal for the new facility is to ensure full wireless capacity. This will be accomplished with two network drops in each classroom space, two for the teacher's main station, and ceiling mounted network access points. During the feasibility and visioning sessions, several community members raised concerns relating to the health effects of Wi-Fi. During a December 2016 School Committee meeting, the Standing Committee on Teaching, Learning and Student Supports made a report to the full group, part of which included a motion to develop a set of best practices relating to mobile devices. The presentation also stated that the City of Worcester, in policy practices and design decisions, follows the recommendations of the FCC, the governing body on Wi-Fi exposure.

As the Doherty community worked to develop this Feasibility Study, the goal is to increase the number of vocational offerings available for students. One identified vocation - Programming and Web Development - was chosen due to the demonstrable interest among students, as well as the expanding labor market in the local, state, and national regions.

As the school personnel, curriculum advisors, and the advisory council develop the Programming and Web Development program, the goal is to create a partnership with the district Information

Technology office, establishing an in-school functional training center. This Information Technology office space would house the school-to-district networking infrastructure, include office and computer workspace for the district's Information Technology Support Specialists, the personnel who maintain the school's software and hardware needs. These Support Specialists would also serve as partners with the vocational program educators to provide practical experience, tutoring and training, and mentoring to the vocational program students. The Information Technology office would, in essence, function as a workspace for the school's Support Specialists while doubling as an industry-standard worksite for students to apply their curriculum knowledge and skills from their coursework. This partnership will be a critical component within the proposed vocational programming.

To welcome students, parents, community members, visitors, and others to the school, an interactive display is desired in the lobby near the main entrance. This display will provide branding and integrate the history of the school, but also provide valuable information, such as office locations, to visitors. The suggestion for an interactive welcoming display originated during the visioning process and then fortunately, we were able to observe an interactive display during one of our school visits to a newly constructed high school, Billerica Memorial. We envision this tool as a means to integrate technology, an identified priority, and we view this as an invaluable way to share information with visitors and members of our school community alike in an interesting and engaging manner. The entire branding package will support our desire to capture our sense of belonging, to foster school spirit, and to capture valuable connections between our school's past, present, and future. We plan to have our students involved with the development of our branding package design. To strengthen partnerships and relationships throughout the school, students from the Programming and Web Development program will liaise with organizations, athletics, clubs, academic and support departments, etc., and create and maintain the displays available for viewing in the lobby.

The Technical Services/Information Technology space in total will encompass ~~5000~~ 4500 square feet, will house the school's critical servers, networking, and related hardware, and will be comprised of the following:

- One secure access room to accommodate the Main Distribution Frame (MDF). At 150 square feet, this MDF includes the interface between the telecommunication utility's and the school's access connection (demarc to fiber connection), the primary routing switch for the building, as well as the network hardware enabling network access for the building. The server and related infrastructure are to enable Doherty to access critical technological services. This technology requires 200 Volt service and must be climate controlled.
- A technical equipment receiving and storage room. At 500 square feet, this space would ideally connect the IT office space to the exterior of the building, allowing for deliveries and access to district personnel as needed. This space would double

as the storage and maintenance location for the school's generalized audio/visual needs (e.g. projectors, document cameras, video players, microphone and speaker equipment, etc.).

- A multi-use space.
    - At 2000 square feet, this space would be subdivided to house 8 individual work-stations for the Support Specialists. The Support Specialist work-stations will service both Doherty and district-wide technology needs. Each school is assigned a Support Specialist, and so Doherty's Support Specialist would be allocated a workstation in this space in which to work. ~~and~~ This space will enable multiple students to engage individually with professionals at the same time. Each work-station would include an individual home-run or link into the Main Distribution Frame, a computer station, and a workbench/desk. The station would require network access and be serviced with multiple 110 Volt outlets.
    - The remainder of the multi-use Information Technology space would be an open-concept conference set-up, so that a group of students can work together, but also enable Support Specialists and IT Staff from across the district to have a collaborative workspace. The conference set-up and additional work-stations support district-wide needs.
    - With the inclusion of the Programming and Web Development Vocational Program, Doherty plans to utilize this combined IT space collaboratively with the Support Specialists: The Support Specialists will have a role within our vocational programming. Students will be able to work with Support Specialists to engage with their curriculum through real-world applications. Upper-class students will have opportunities to complete their co-op or internships in-house alongside the working members of the IT department.
    - The space would include Audio/Visual technologies for presentations, collaboration, etc.

All IT spaces will be accessed via ID cards, providing permissions for authorized personnel. The MDF/IDF and network will be supported by generator-provided back-up power if needed.

The Information Technology office, storage room, and MDF should be adjacent to the vocational Programming and Web Development classrooms due to the close integration of the functional workspace with the academic instruction and opportunities for practical experience.

The Information Technology Support Specialists maintain the school's network infrastructure, but also service school equipment including desktop and Chromebook computers, projectors, switches and servers, etc. The Support Specialists, working in-house, would, in part, help ensure reliable access to network services throughout the day. Reliable access, and available personnel to troubleshoot issues, is vital as more and more classroom learning activities and standardized assessments are computerized. The design would therefore include a lavatory space-sink and toilet-adjacent to or within the Information Technology office space so that both students and school personnel can maintain hygienic conditions when working with this sensitive and costly equipment.

In addition, several spaces within the design will include Cable TV capacity. These include the main office, MDF/IDF rooms in the IT space, library, and the cafeteria. Access will not be wired to each classroom. There will be converters for broadcasting from the gym or auditorium through the network, as needed.

Media Center/Library

The Media Center/Library is located on the second floor of the existing school structure. The Media Center/Library houses a set of approximately 6,000 books, including fiction and non-fiction texts. These books are primarily used for student use, both recreationally and for classroom learning activities and assigned reading tasks. The Media Center also contains a variety of DVD and VHS videos supporting a range of curricular topics. These videos are available for teacher use. The Media Center offers an assortment of magazines as well, supported via donations from a variety of sources. Years ago, the Media Center also included a computer lab, available with reservations for classroom use.

There are currently two Chromebook carts, providing a total of 60 devices, available for student and/or educator use. There are three desktop computers which offer print capabilities to students working in the space. Currently, student Chromebooks do not offer direct-to-printer access. A projector and a portable white board are also available.

During the school day, students are able to get passes to come to the library. Typically, this occurs when a teacher is absent, and the student is able to sign in. Students often then use the available devices for research and for classroom assignments, or are able to work individually or in groups at one of the available tables in the space. There is no private collaborative workspace however: student groups may be working and discussing project tasks next to students working privately on their own.

The Media Center is staffed by a full time, certified librarian, and is further supported by several staff members for which their duty is to assist and monitor students utilizing the space.

The Media Center opens approximately 30 minutes before the start of the school day. A staff member is assigned to supervise the space, and students are able to sign out Chromebooks, use the desktop computers to print as needed, to check out texts, and are able to get a pass for an instructional period later in the day, when available. Similarly, the Media Center is open for 40 minutes after school, again for students to have a space to complete homework, work on classwork activities, or collaborate with others. Another staff member is assigned to the space after school to provide supervision.

During the school day, the Media Center can be reserved by staff for classroom use. Most often, educators reserve the space and bring their classes to the Media Center in order to utilize the available Chromebooks. At times, educators will use the space to conduct student presentations. Administration occasionally reserves the space for district-level meetings, though due to the layout, available technology and limited on-site parking most administrative meetings are scheduled for another location with more readily available amenities. At times throughout the year, the Media Center is reserved in order to administer various standardized exams, including MCAS, AP Exams, ACCESS testing, etc.

Doherty Memorial High School is currently working on a repurposing of the existing Media Center space. With the removal of desktop-based computer labs across the school and the acquisition of mobile Chromebook carts, the frequency of staff bringing their classrooms to the space has decreased.

The school community envisions an up-to-date, flexible space that allows for student, staff, administrative, and community use. Increasingly, students are engaging in collaborative learning tasks requiring research, synthesis of skills and content knowledge, and the development of a presentation or a product to share with others. A flexible workspace providing appropriate technology, a level of privacy so as to not hinder the work of others, and with the convenience of access throughout the day will enable students to engage in rigorous, multi-disciplinary performance tasks. Similarly, a modernized space with audio/visual and presentation capabilities will allow for effective staff use, such as for collaborative conferences, administrative meetings, etc. In addition, Doherty will be able to make the Media Center available for student community use, including during non-school hours.

Moving forward, the Media Center still needs to serve as a repository for text materials. However, there is greater potential for the space. The design and implementation of a ‘learning commons’ space would enable all school and community members to have the flexibility to utilize the space based on the needs of their performance task. Additionally, the vision for the new facility includes a career center, a cafe, and multiple printing stations per each grade to be located in the media center area.

Makerspace

At the start of the 2019-20 school year all members of the Worcester Public Schools participated in the district's fourth annual Opening of School Convening and Recognition of Excellence ceremony. Keynote speaker Jaime Casap challenged the audience to think about technology and reminded us not to "ask kids what they want to be when they grow up but what problems do they want to solve. This changes the conversation from what I want to work for to what do I need to learn to do that." This challenges us to provide opportunities for students to explore and to create as part of the learning process.

As summarized in the 2018 Stem Learning Design Report, 'Review and Recommendations of Best Practices for K-12 Learning Spaces,' schools and districts are shifting educational decisions and methodologies to align with the 'innovation economy model.' Doherty Memorial High School readily agrees that students need learning opportunities that emphasize process skills, decision making, contextual and community-based problem-solving experiences, etc. The vocational engineering program offers a subset of the students' ample opportunities to acquire content knowledge as well as practical, competencies and skills. The desire and goal are to increase the range of innovative learning models available to all students, regardless of their choice from the various educational programming options being proposed, and this is in agreement with the STEM Learning Spaces report:

> Schools have begun looking for opportunities across the curriculum to integrate more of a process focus, including engineering design and prototyping, to prepare students. Learning spaces to support this model focus on collaboration and sharing tools, inclusion of a wide variety of materials and small-scale mechanical and digital tools to quickly prototype and test solutions, and flexibility for regularly changing projects or contexts. (p. 12)

As students' progress through the K-12 system, en route to college and/or careers, there is a clear demand to ensure that students have mastered a suite of readiness skills across a range of content areas. Currently, students have opportunities to engage in rigorous learning experiences that reflect interdisciplinary and integrated learning. Notably, within the Engineering Technology Academy, the school's vocational Engineering Technology program, students complete several 'learning fair' projects. These projects are designed by an interdisciplinary team of educators representing Engineering, Science, Mathematics, English, and Social Studies. Over the course of weeks, students complete a variety of tasks within and across their courses, ultimately integrating all components and presenting their work in a family and community forum.

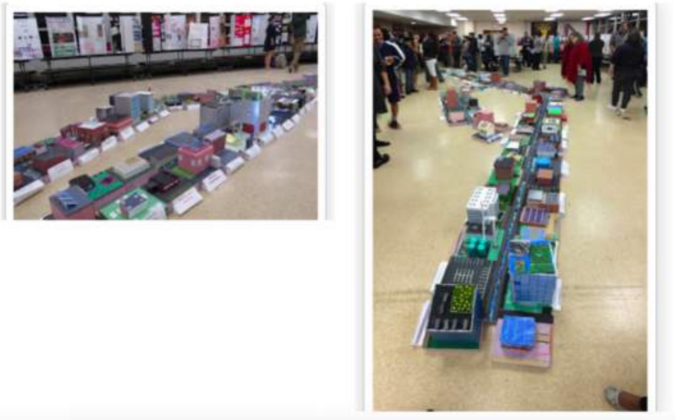
Figure 3

Figure 4

A student's display containing elements from each of his five core academic classes: Engineering, Science, Mathematics, English, and Social Studies. All projects are then on display for students as they share and discuss their work with family and community members attending the learning fair showcase.

Figure 5

Figure 6



Each ETA student designed a parcel of land based on various zoning criteria. Combined, the students recreated the path of the Blackstone Canal, originally running through sections of Worcester. Students reimagined the Canal district, incorporating environmentally friendly designs and that accommodate the needs of a diverse community.

Outside of the teamed ETA, integrated learning is relatively new for many students and staff. This is mainly due to a lack of space for common planning and for interdisciplinary planning, existing space and technology limitations, and the lack of much needed adjacencies between and among various departments. Often, teachers within their individual classes will design learning activities that incorporate multiple domains of learning and that span content areas, but there are challenges to implementing true cross-disciplinary work that brings multiple classes and content educators together.

The vision for the new Doherty Memorial High School is to incorporate design features to enable students and staff opportunities to engage in interdisciplinary learning. For example, the feasibility design is planning for ninth grade academies or teams, where educators would share similar groups of students within a close set of rooms, allowing for greater flexibility regarding the schedule, mixing student groups, and accessing and sharing the strengths of staff and students alike. There will be improved common planning space and adjacencies between and among departments to foster collaboration, interdisciplinary connections, project-based learning and real-world applications, which were priorities that were identified through the visioning process.

To support this collaborative effort, and enable all staff the opportunity to work together, e.g. in STEAM based learning experiences, the new Doherty Memorial High School will include a Makerspace that will be accessible to all. The goal is to integrate the available classroom technology, including Chromebooks, with modern and industry-standard equipment that, to date, many students have not experienced or utilized. This equipment includes, for example, 3D printing technologies, hand and simple power tools, manufacturing technologies, presentation technologies, and a range of learning materials based on the varied projects and student activities occurring within the space. As supported in the STEM Learning Design (2018) report, the space will enable flexibility as educators can plan for varied projects, changing equipment utilization, and that enable all educators within their core academic programs to have opportunities to utilize the space with their students.

While Makerspaces are often associated with STEAM education, there are robust opportunities for all staff from all content areas to enable their students to work collaboratively. Due to the collaborative nature that promotes group work, the MakerSpace will ideally be adjacent to the Media Center, which is a site that allows additional flexibility relating to group or project work, as well as for student presentations and showcases of their work. The space will be staffed by the school's Media Specialist, and this staff member will be responsible for maintaining the schedule and coordinating logistics, as needed. The Media Center's collections, technologies, and physical layout are designed to enable students to access resources and materials, along with instructional support from the educator and the Media Specialist/Librarian, as they engage in increasingly personalized learning activities. The adjacent MakerSpace supports student work as they hone their skills in preparing for entry into a 21stcentury workforce.

As the Media Center will be available for community usage, student work-both in progress and finished products-will be displayed, showcasing the students' abilities and talents as they engage in rigorous curricular learning activities.

H. Visual Art

The Visual Arts Program in the Worcester Public Schools offers students an in depth exploration of the standards identified in the Massachusetts Arts Curriculum Frameworks (1999) and is informed by the National Core Arts Standards (2014). Support for classroom and after school activities are enhanced through partnerships with local and national cultural organizations.
At Doherty, in the Visual Arts department currently, there are three rooms dedicated to the teaching and learning of visual art. Consistently over time, we have received many more requests from students to participate in course offerings in Art than we have been able to accommodate. One credit in the Arts is required for graduation for all students in the Worcester Public Schools and we need to have appropriate space to offer additional courses to support student interest and fulfill this requirement. Beginning this year 2019-20, we are offering an Early College Course in Drawing on our campus as part of our partnership with Quinsigamond Community College.

Despite the recent staff increase from one Art teacher to three, the need for additional and more appropriate space continues for the study of visual art. Of the three classrooms dedicated to visual arts, only one of the rooms was actually designed for this purpose and is in need of updating. There is a need for increased number of working sinks, additional and flexible space for students in the art classes to work, and an improved centralized area to display their talents to the school community and the community at large. Despite the challenges of our current facility, our art students have won several different awards and have been recognized for their talent each year. Currently we have student work displayed in some areas of the school and we value the ability to showcase the incredible talent of our students, but much more space is needed to do so.

The vision for the new school includes increased staffing due to increased enrollment and additional and more appropriate space. In order to support teaching and learning in the visual arts we need classrooms with flexible furniture and adequate workspace, functional sinks and increased storage space. The art rooms should be located adjacent to one another in order to support collaboration and shared ideas and supplies. A digital art learning lab should be included to support several desired additional courses and to support the digital portfolio development needed for Advanced Placement Studio Drawing and for many college applications. These spaces would facilitate the implementation of our art education program and allow us to offer additional coursework such as AP 3D Art and Design, printmaking, graphic art, digital media art, digital photography, ceramics, sculpture, and digital illustration. As we move toward implementing the recently developed Arts Frameworks, which are currently posted for public review and expected to be fully adopted in the very near future, it will be important to have appropriate space and technology. There is a need for additional collaborative space, called Common Rooms, to support the design and implementation of a cohesive art program.

Additionally, we would be able to incorporate the visual arts will our STEAM subjects and to support our proposed Chapter 74 programming that involves STEM. One credit in the Arts is required for graduation for all students in the Worcester Public Schools.

This flexible space, designated on the space summary as “Common Rooms,” will provide for multiple orientations and uses, with flexible furnishings to account for current and future needs. These are multipurpose spaces for the benefit of all departments. These common ~~areas~~ rooms will provide ~~within~~ sightline access to ~~of~~ classrooms, are designed to facilitate break-out sessions and will support such opportunities, and will allow for shared presentations and collaboration among classes. Additionally, there needs to be spaces will provide areas for the Visual Arts Professional Learning Communities (PLCs) to meet to collaborate and to support professional learning, complete with areas for presentation and modeling classroom. The arts program would benefit from additional storage pace in this shared collaborative space with individual work areas for each art teacher and dedicated storage space for their course-specific media.

Students would benefit from an outdoor workspace that is within easy access to and within visual sightlines of art classrooms, and an interior community space beyond the classroom with glass enclosed shelving to exhibit 3D work and permanent and movable boards for students to exhibit 2D work. As the design moves forward, the district will ensure that any outdoor space is fully accessible to users with mobility impairments. This space can be used for displays as well as for demonstrations and would benefit from furniture that allows for flexible seating arrangements. Classrooms should be neutral tones and have large windows for natural light with shades to darken classroom, interior multipurpose lighting, exhibit space, bulletin boards, white boards and a large space for students to create autonomously or in groups. Classrooms should have closets, deep sinks, long and wide countertops to work on big projects, large desks for students to allow for flexible seating arrangements, tables to accommodate multimedia and center working, drying racks, classroom cabinets with locks, and long, wide, and deep shelving for project storage. Each room should have easel space, technology space using both the distributive technology model (Chromecarts) as well a computer stations for a digital art lab, several electrical outlets throughout the room, wall area for vertical drawing, interactive screens, bulletin boards and white boards.

Floor plan should include a digital graphic arts room, ceramics and kiln room which will be located in a space accessible to the instructional space that is able to be secured for safety reasons. Visual Arts classrooms need to be located in proximity to the performing arts neighborhood to support collaboration among classes in the arts.

I. Performing Arts

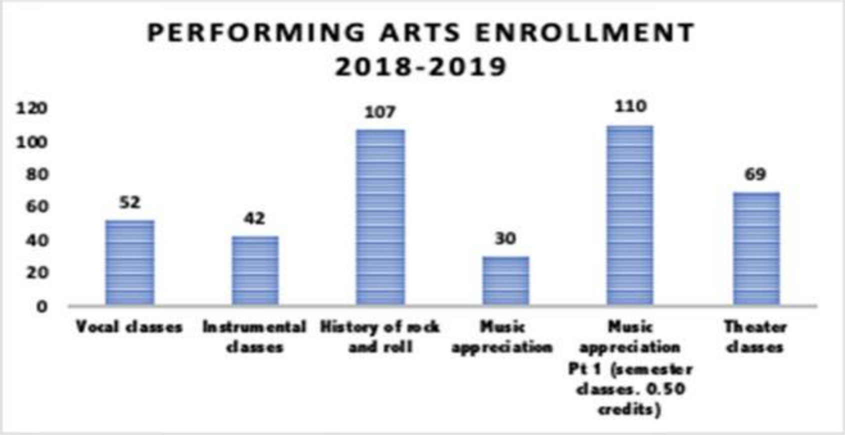
Doherty Memorial High School offers a variety of full year (1 credit) and semester (0.50 credit) music courses and full year (1 credit) courses in theater arts, both of which provide students with the opportunity to explore the history of the subject and /or develop their performance skills.

In 2018-19 the current 1-credit music course offerings included Chorus-Vocal I, Chorus-Vocal II, Chorus-Vocal III and Chorus-Vocal IV, Madrigal Singers I, Madrigal Singers II, Madrigal Singers III, and Madrigal Singers IV, Jazz Ensemble, Band-Orchestra I, Band-Orchestra II, Band-Orchestra III, and Band-Orchestra IV, Music Appreciation, and History of Rock and Roll. The semester-long 0.50 credit courses include Music Appreciation Part 1. The 1-credit theater courses include Theater I-IV.

The Worcester Public Schools' strategic plan notes both student and educator requests to "increase course variety and the opportunity to delve deeply into subject matter and explore current topics" (12). In an effort to support this interest and to provide additional courses in the arts to meet the Massachusetts Department of Elementary and Secondary Education's (DESE) MassCore and Worcester Public Schools (WPS) graduation requirements, additional courses were offered for students. This increase in course offerings was made possible by the addition of a second full-time music teacher.

During the 2018-2019 school year there were 341 students enrolled in music classes, either music history/appreciation or a performance class. Additionally, 69 students participated in theater arts courses. The school offered five sections of Theater Arts: three of these sections were Theater I while the additional two sections were comprised of a mix of students in Theater II-IV.

Figure 7



All of the performing arts classes are scheduled in the two classrooms in the music wing located behind the auditorium/stage. These classrooms were designed for use as music classrooms. The larger classroom (101) was designed for instrumental classes and the smaller room (103) was designed for vocal classes. Currently, the Theater Arts classes are held in these same classrooms.

Performing Arts classes utilize a variety of instruction methodologies including but not limited to whole group and small group instruction and modeling, small group activities, and individual exploration and rehearsal. Teachers work directly with students to instruct them to read music written in standard notation and to learn instrumental and vocal technique. Students are provided opportunities to perform individually and in small groups and large groups within the specific classes, within the school, and within the community at public performances. Students in the vocal classes have the opportunity to sing, alone and with others, a varied repertoire of music. Students in instrumental classes play instruments, alone and with others, to perform a varied repertoire of music. Students in music classes also engage in critical response through whole group instruction and modeling which includes activities such as listening to musical performances and participating in whole class, small group and individual reflections. Students utilize technology in order to access the course curriculum, explore musical pieces and music history and to engage in reflection of these topics utilizing technology. A Chromecart is available on the first floor to support this integration of technology but it is a shared cart and must be moved to the music wing for classroom use.

Within the theater arts classes curriculum is delivered through whole group instruction and modeling in includes activities such as viewing performances, both live and recorded. Students engage in blocking, rehearsing and performing scenes from and productions of entire works in order to demonstrate knowledge of the theater arts curriculum standards. Students work collaboratively in both large and small groups and require space to do so. Additionally, theater arts classes utilize space to demonstrate and to block scenes for class use and to rehearse. Theater classes perform formal dramatic productions for a variety of audiences including their peers within their class and the school as well as public performances both during and after the school day.

The music wing, in addition to the two classrooms, has four small practice rooms, a music office that currently doubles for small group rehearsal space and storage and an additional practice room that was designed and predominantly used for costume storage.

The stage is located directly in front of the orchestra-instrumental room (101) and is used to as part of the instructional space for all performing arts classes. While the stage is an essential part of the auditorium and is often utilized for presentations and small-scale school assemblies, it is also an instructional space which provides opportunities for the students to learn and practice blocking, home their technical theater skills and musical presentation skills, and allow them to have authentic real-world application of these skills.

The orchestra room (101) is located directly behind the stage and provides the only access backstage to the right wing of the stage. The lighting board is located in the left wing of the stage but its current location limits space in the wings as well as a clear view of the full stage during performances. The catwalk is only accessible by ladder through a side hallway off of the auditorium and as a result is inaccessible by students. The location and condition of these dated items make it difficult to address the curriculum standards, especially in theater arts which requires students not only to learn about the technical theater but also to participate in the technical aspect of the performances.

The vision for the performing arts space in the new school includes additional classroom, rehearsal, and performance space to successfully deliver the performing arts curriculum (music and theater) and grow both the music and theater programs at Doherty Memorial High School. During the numerous school- and community-based visioning sessions, all groups consistently identified as a priority a need for increased programming within this department. We would like to add AP Music Theory to the course offerings in the music department. This course was taught as part of the music department in past years but has not been offered for several years. There also is a desire to expand the theater course offerings. Increased staffing and the availability of additional classroom space in the Performing Arts neighborhood would facilitate the ability to offer these courses. The current layout of the music wing and its classrooms limits the number and type of classes that can be offered at the same time. Room 103 is designed for chorus/vocal classes only. The room is constructed with tiered flooring (mimicking risers) /rows for seating for vocal practice with limited, narrow floor space making it difficult for instruction in other types of classes. This room currently is used for theater classes but the tiered flooring and limited level space at the front of the room makes it difficult to implement the theater arts curriculum. There is limited space for blocking scenes, modeling techniques, and conducting small or large group performances in-class or for other classes in the school. It cannot be used for small-scale public performances either. This classroom is also used for courses such as music appreciation and History of Rock and Roll. The current configuration of the room makes it difficult to arrange the room for discussion or to implement instructional strategies/activities that require students to move around the room (e.g. gallery walk, inside-outside circle. etc.)

The existing design of music wing allows for only one instrumental class to be offered at a time. Room 101 is designed with tiered flooring arranged to allow for orchestral instruction/rehearsal. This is the only room designed for instrumental use/instruction. There are only four small practice rooms in this wing, and they are at the end of the hall, away from the classrooms and lack visibility from the classrooms. There is a need for individual/small group rehearsal/ collaborative space for all students in the music courses. This space needs to be designed to reduce sound distractions during rehearsals yet still be within the sightline /hearing of the classroom teacher.

There needs to be additional classroom space for theater classes. This space needs to have room to model acting techniques, demonstrate/teach blocking, and engage in individual and group scene work. There is a need for space to allow for small-group collaboration and rehearsal.

All of the performing arts classes require visual access to rehearsal areas and open spaces where small groups can collaborate and rehearse. Additionally, there needs to be easy access to public spaces such as the stage and its adjacent seating (auditorium). These areas are public areas and there needs to be a way to keep the classroom/educational spaces secure and yet easily accessible when needed.

The Massachusetts Arts Curriculum Frameworks indicates that music students need to be engaged in improvisation and composition, demonstrate the ability to rehearse an ensemble of peers, and conduct live performances. As a result, there is a need for a variety of performance venues for class and school use. Providing multiple performance areas for class, school, and community use in the design of the new facility was also a priority that was identified through the visioning process. A 90-100 seat multi-purpose "black box" theater area within the performing arts wing with flexible stage area, flexible and moveable seating, sound, projection screen, and a flexible lighting system would allow an additional performance space for small-scale performances. This area can be used for presentations/demonstrations with music, vocal, and theater classes and the flexibility of this space would allow students to demonstrate knowledge of the curriculum standards, especially the advanced theater standards which require students to demonstrate knowledge of technical theaters and the ability to lead a technical crew, create and implement a major design element (scenics, lighting, sound) for a production, coordinate all aspects of a production by stage managing a theatrical event, and apply technical knowledge of safety procedures and practices in the use of theatre equipment, tools, and raw materials.

This black box flexible space will be used as a more intimate practice and performance space for band and chorus ensembles, as a location to showcase or present projects from all departments, and for "Coffee House" events. As performing arts classes run simultaneously with extracurricular activities such as theatrical productions or housing guest speakers, Doherty will require varied and flexible options based on the class and/or organization's need.

Locating the performing arts neighborhood in close proximity to the auditorium and stage will enhance the learning opportunities for students. The auditorium can be used for in-school and public performances and presentations and should have a capacity of 800 or 900 or half of the school population. The stage itself needs to have adequate space in the wings to accommodate scene changes and cast and crew access to the stage, curtains and other performance technology. A space needs to be designated for the stage manager to coordinate backstage/production details.

A large overhead door on the back wall of the stage is necessary to provide access to the makerspace, loading dock or street. Any large door in this area with street access should be insulated both for weather and acoustic isolation.

The stage needs to be large enough to accommodate large ensemble casts, orchestral groups and choral groups. Sightlines on stage need to be considered in the stage layout in order to provide a full view of the stage from throughout the audience/seating area. The proscenium needs to be large enough accommodate the appropriate fly area, rigging, lighting, and curtains.

A lighting booth should be located at the back of the auditorium to allow for a clear view of the stage and allow lighting crew to control the lights on the stage and in the house. Dimmable house lights are needed to accommodate the various types of presentations that will occur in the auditorium. This lighting booth may also be used to run the sound board and is a needed instructional space allowing students to gain first-hand experience with the aspects of technical theater.

Auditoriums are incredibly sound-sensitive, so no matter the size or scope, a theater space's mechanical, electrical and plumbing system should be designed by engineers who have prior theater design experience. Ductwork must be oversized (and often lined) to eliminate objectionable fan and air velocity noise. In addition, plumbing chases should be independent of both house and stage perimeter walls. Acoustics and placement of lighting needs to be taken into consideration when designing the ceiling of the auditorium.

The theater classes partner with classes in the music department and these programs need to be in close proximity/adjacency to these courses to allow for collaboration and rehearsal. A performing Arts neighborhood would allow for such collaboration between these courses and with other arts course within this arts neighborhood. In addition, the performing arts programs require additional spaces for performance preparation. They need to be in close proximity to restrooms and have a space that can be provide privacy for costume changes. A dressing area, including a sink, with ten to fourteen private stalls (based on the average number of most current productions) could accommodate an ensemble cast while also provide a dressing area for student performers who might have more frequent or fast costume changes. in addition to areas to store costumes. There is also a need to have access to sinks for cleaning and working on sets. Additionally, the theater department needs adjacency to the visual arts department to allow for collaboration and to maximize the use of creative space for set design and construction.

As we design a facility that enables students to engage in rigorous learning activities and contextual innovative projects within their core academic settings, the goal is to implement a Maker Space style area within the performing arts region to support the students' ability to apply technical knowledge of safety procedures and practices in the use of theatre equipment, tools, and raw materials. Students need space to be able to develop and refine artistic techniques and work for presentation (Massachusetts Arts Frameworks- T.T.6) that support organizing and leading the production of technical elements such as scenic, lighting, props, costumes, sound, or makeup design in a dramatic presentation (Massachusetts Arts Frameworks- T.T.5). This area should be located close to the stage to allow for easy access and to support the creation and implementation of these major design elements for a main stage production. Large/oversized doors in this area stage will facilitate access to the stage.

A makerspace adjacent to the arts space would support such student work which is not appropriate for a general education/performing arts classroom, given the tools and equipment needed and the nature of this messy work. Once constructed, these sets will remain in place for an extended period of time allowing for performing arts students to refine their design and construction skills and to refine and complete artistic work (A.C.T.Cr. 03).

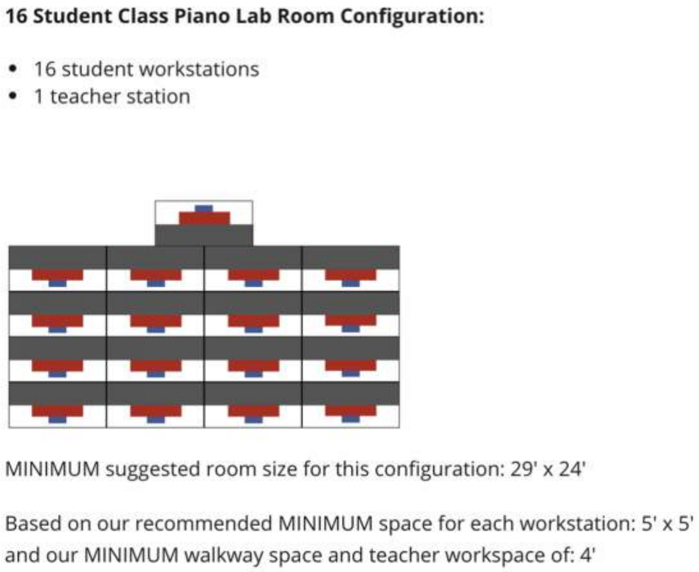
Additionally, Doherty envisions this space to be used by performing arts classes and extracurricular groups, e.g. for the musical, the theater club, the art club, etc. Currently, Doherty’s performing arts classes and extracurricular organizations offer multiple theatrical productions throughout the year. Each of these requires set design and construction. Even after the sets are built, they remain built for lengthy period of time until the performance(s) is/are completed. Doherty classes and clubs build sets on the stage itself as there is no additional space available. This prevents the stage from being used by any other class, limits the use of the stage for group assemblies/presentations, or from any outside organization from using the space, during that time. The auditorium and stage are regularly limited or not available for general teacher use. During the 2019-2020 school year, due to overcrowding, several classes have been assigned in the auditorium. Numerous repeated comments made during visioning sessions noted the need for multiple performing arts spaces. Building/keeping sets on the stage in the auditorium would limit the performing arts space that is available for the school throughout the year.

Storage space is essential in the performing arts neighborhood. Music and theater classes both require specific and often over-sized materials, whether they be instruments, music scores or large props such as furniture or multiple small props. These materials are used as part of the instruction and to support the delivery of the curriculum, allowing students to have a hands-on, authentic performing arts experience. Space that is easily accessible with appropriate storage methods (shelves, cabinets, closets/wardrobes, instrument storage, prop storage, and set piece storage, set construction materials such as lumber, paints and tools) and can be used to secure materials

Access to technology is becoming increasingly important in all areas of the curriculum, including the performing arts. This collaborative space can also house the piano lab which will allow for increased opportunities for students to learn and practice the piano as well as experiment with music composition and arrangement and explore music theory. Piano labs that are equipped with a teacher-student communication system supports differentiated instruction in the music classroom allowing the teacher to instruct and support students with varying levels of proficiency within the same class. Students may work individually and in small groups in this setting to practice and refine their keyboard skills. Standard piano labs support between eight to sixteen students and need to be equipped to provide the teacher with a controller and headphones to monitor /listen to student progress. The lab needs to have individual student workstations/keyboards with headphones for each student.

The piano lab will be staffed by the music teachers and when a specific class is not scheduled into the piano lab during the regular seven-period day, it can be used on a rotating basis, under teacher supervision, to allow students the opportunity to work individually and in small groups to practice their skills both during and after the school day. As the lab will be staffed/supervised by the music teachers, there needs to be a teacher station with a conferencing system that allows the teacher to communicate with students and to supervise student progress. A standard piano lab with sixteen workstations requires a room that is at least 29’ x 24’ to accommodate each 5’x 5’workstation and a 4’ walkway and teacher workspaces.

Sample Configuration:
Figure 8



16 Student Class Piano Lab Room Configuration:

- 16 student workstations
- 1 teacher station

MINIMUM suggested room size for this configuration: 29' x 24'

Based on our recommended MINIMUM space for each workstation: 5' x 5'
and our MINIMUM walkway space and teacher workspace of: 4'

https://www.musicarts.com/cms/Classroom-Piano-Labs

A dedicated piano lab, staffed by the music teachers, will allow for individualized attention to students and differentiation of music instruction, providing support for music students at all levels. Students will be afforded the opportunity to study piano, something that is not possible for many students outside of school for financial reasons. Additionally, a dedicated piano lab will afford students with the opportunity to explore and create original music compositions as noted in the Massachusetts Arts Curriculum Frameworks (A.T.P.05) as well as to develop and refine artistic techniques and work for presentation (ASE.M.P.05). Between the music classes, both instrumental and theory, this lab would be utilized consistently throughout the day. Its adjacency to the music classrooms would allow for easy access for music teachers to bring their classes to the lab and to have visual access for supervision of individual students using the lab or practice and/or composition. This lab will help to support music skills and allow for cross- curricular sharing with the theater department as the two departments collaborate to provide instruction in musical theater both during and after the school day.

Collaborative spaces such as this can help students to listen to music and identify the parts of the composition as well as to learn to build their own musical compositions. This can be accomplished by establishing lab within the neighborhood than also can house desktop computers used for composition and can be shared with other performing and visual arts classes. This shared arts computer lab will provide opportunities for students to experiment with sound and composition through Musical Instrument Digital Interface (MIDI) software programs such as

GarageBand. This program allows students to explore music at their own pace while benefiting from teacher support in a group setting. Using GarageBand will allow students to build their own songs and to collaborate with their peers on compositions, experiment using virtual software instruments. This will require a computer lab space with room for desktop (Mac) computers to support this program. GarageBand allows students to record and listen to themselves. This shared lab will be used during the music classes and will be staffed/supervised by the music teachers. When not being used for specific music instruction, this lab will provide an opportunity for cross-disciplinary sharing and collaboration as students and teachers from other departments can utilize this space and program to record and listen to themselves to support fluency. Speaking skills are essential as noted in the districts' High Quality Reading, Writing and Discourse document and access to this program will benefit all students.

The dedicated teacher planning space will allow for collaboration among music, art, and theater teachers to support student work and collaborative projects in the arts. Production meetings as well as individual auditions can be held in this space.

Currently, Doherty staff's two full-time music teachers as well as one full-time theater arts teacher. All programs are full and wait- listed students are consistently looking for opportunities to join. In addition, the school infrastructure and classroom space currently limit the course offerings. Doherty intends to expand the teaching staff within the new building to better meet the needs of students in offering additional and more varied music and performing arts classes. As the program grows, there will be increased opportunities for teachers within the two departments-Theater Arts and Music-to collaborate.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

Doherty understands that these spaces exceed MSBA guidelines and are above and beyond the allotments within the template. However, the school's scheduling challenges, wait lists for programming, and student interest demonstrates the need for such space. Recent expansion of our visual arts program has added an additional art teacher allowing the school to plan to expand the current visual art courses to meet student interest and to alleviate the need for wait lists for art courses.

J. Physical Education/Health

The goal of the Worcester Public Schools Health and Physical Education Department is to provide students with the necessary skills which enable them to make safe and healthy choices in a variety of situations. In addition, students are given those skills which are needed to make fitness a life-long habit. The Health and Physical Education Curriculum, which is aligned with the Massachusetts Comprehensive Health Curriculum Framework, is taught by certified Health and Physical Education teachers.

Doherty Memorial High School offers a semester (0.50 credit) courses in health and quarter (0.25 credit) courses in physical education (PE). The current 0.25-credit physical education course offerings include Physical Education I-IV.

At Doherty, Grade 9 students participate in Health I classes for a semester. The health classroom is not in close enough proximity to the gymnasium which precludes the type of collaboration that we would like to support between the Health and Physical Education teachers. The vision for the new school is to increase the number of health teachers and the number of classrooms to support the growth of the health course offerings. The School Adjustment Counselors deliver the Signs of Suicide (SOS) Curriculum through the health classes each semester in collaboration with the health teachers. We view this particular program as a vital component of social-emotional learning for our students since the content literally can be life-saving as the topics focus on recognizing and reporting signs of distress, depression and suicide prevention through the application of Acknowledge, Care, Tell (ACT).

All students participate in Physical education classes each of their four years for a duration of ten weeks per year and earn 0.25 credits. Students must participate in Physical Education each year in the state of Massachusetts and participation all four years is needed in order to graduate from the Worcester Public Schools. Currently, there are three Physical Education teachers who teach these courses in our gymnasium. The gym area is divided into three areas: the large gym, and two smaller spaces, one with a few treadmills, and the other with weightlifting areas and cardio machines. The majority of the weights and machines have been donated to the school, and the number of machines and weightlifting stations are insufficient given the number of students enrolled in these courses. The area is not large enough to fully implement the types of course offerings and fitness training that we would like to offer to our students. There is some office space for male and female physical education teachers, but these spaces need to be improved.

The vision for the new school is to substantially increase the size of our gym and the areas adjacent to it in order to increase the array of possibilities for our physical education courses and to better support our successful and well-established athletic programs. The number of teaching stations will increase to five and dramatically improve the space that is dedicated to physical education and health fitness habits. The office space for these teachers will be improved and expanded. There will be classes in team sports offered in the large gym area with a variety of activities in order to provide our students with options and to differentiate the concepts they are learning in order to meet their diverse needs. Storage space for equipment for these areas needs to be provided. There will be an area dedicated to weight training and conditioning sufficient to accommodate the number of students who wish to participate in these types of activities. Additionally, there will be a space dedicated to classes including but not limited to yoga, Pilates, and mindfulness. As a result of these vastly improved spaces, we also plan to offer personal fitness, cardiovascular fitness, and conditioning courses. Also, we will be able to allow students to participate in additional physical education classes beyond the required, annual ten-week interval which is important to promote healthy habits and necessary for students who are unable to afford a gym membership in the community and for those who cannot stay after school for physical activities or athletics due to other responsibilities such as work or caring for younger siblings.

This expanded space will also support an array of after school programming. Many students participate in weightlifting activities after school. A powerlifting club was started last year and has generated much interest and participation among our students. We also have evidence of a strong interest among our students in yoga as this was offered as a club activity after school and was well-attended by staff and students. We also have had dance clubs who could benefit from this new space after school and the choreography for the musical could be done in this wellness center rather than in the front lobby or in the cafeteria where choreography has been done historically due to a lack of appropriate space. Students will have a voice in selecting activities within which to participate and a wider array of physical activities from which to choose. The improved space will allow us to work with our students to develop the knowledge and skills needed for lifelong wellness, healthy habits for life, strength training and stress reduction.

There are no specialized provisions envisioned for these Physical Education spaces. Rather, they will provide options for the school's various athletic teams and extracurricular groups more appropriate space for a wide range of work and activities. Currently, some teams or groups practice or work in hallways or crowded areas.

Additionally, there needs to be a space for Adaptive Physical Education (PE) as the number of students in need of this service will increase as the new school will be fully handicapped accessible, while currently the school is not. As a result of the lack of accessibility in the current facility, many students who need Adaptive Physical Education attend other schools in the district as their needs cannot currently be accommodated. The Adaptive PE space will be utilized by students receiving special education services. As the program grows, the school hopes to establish and strengthen its unified programming options, thus providing additional opportunities for special and general education students to collaborate.

As the SD process continues, the committee will be designing and including additional information for review.

We are also seeking to add a Unified Physical Education program to build upon our current participation in Special Olympics and to involve our students with disabilities by pairing them with their peers during physical education classes as well as during our after-school programming. This space would also be used to host unified physical education with the younger students in our quadrant, to build and to strengthen the relationships between and among our neighborhood schools, and to increase our participation in Special Olympics especially during vacation and summer school programs.

Athletics

Our athletic program is extensive, and our athletes are successful. Our students are participants on 49 sports teams sanctioned by the Massachusetts Interscholastic Athletic Association, MIAA: 18 in the fall season, 14 during the winter season, and 17 during the spring. Not only does our participation in athletics support the success of our student-athletes and their ability to compete and to continually develop and improve their skills, both on and off the courts and fields, but it also fosters a strong sense of community, school spirit and pride among our student body, staff and members of the community at large**.** DMHS has a long history of success in athletic competitions and our school has had the highest rate of participation in athletic programming over time in our district as shown in the tables below for all three seasons. (Figures 9-11)

Figure 9

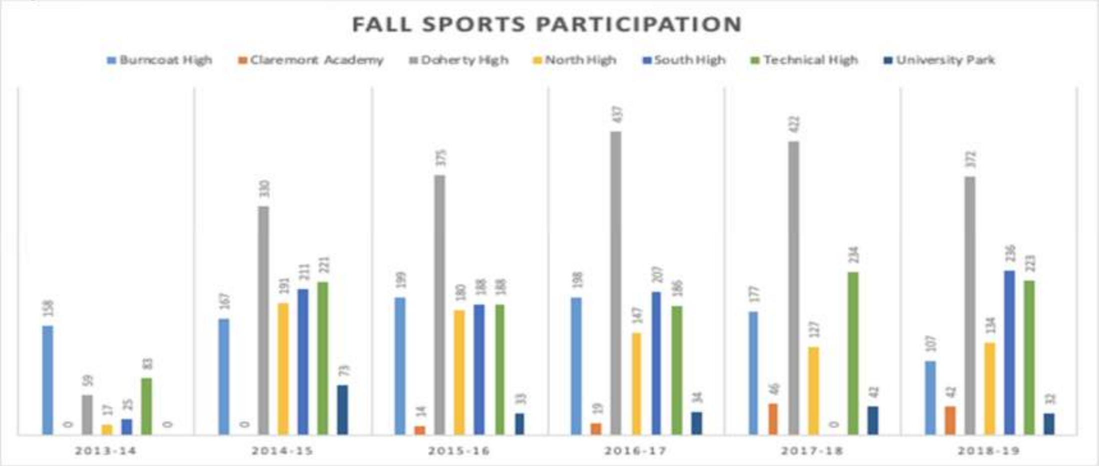


Figure 10

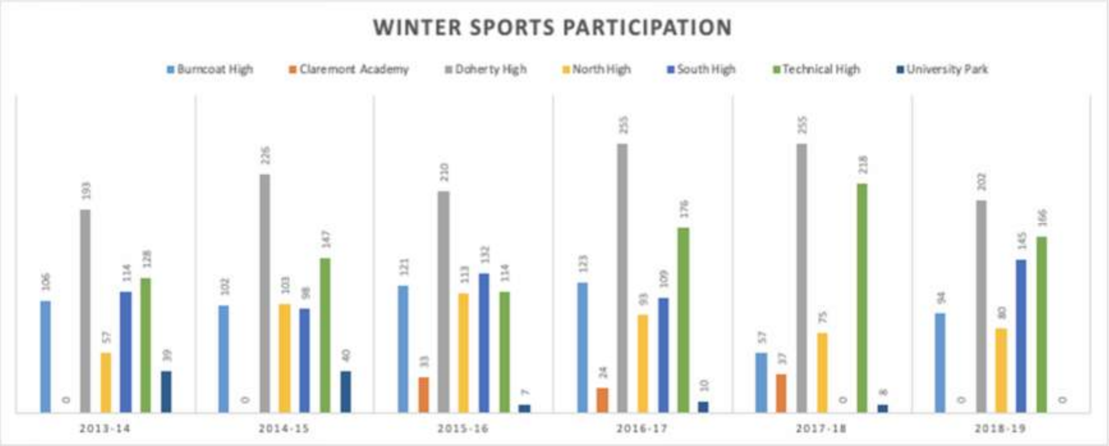
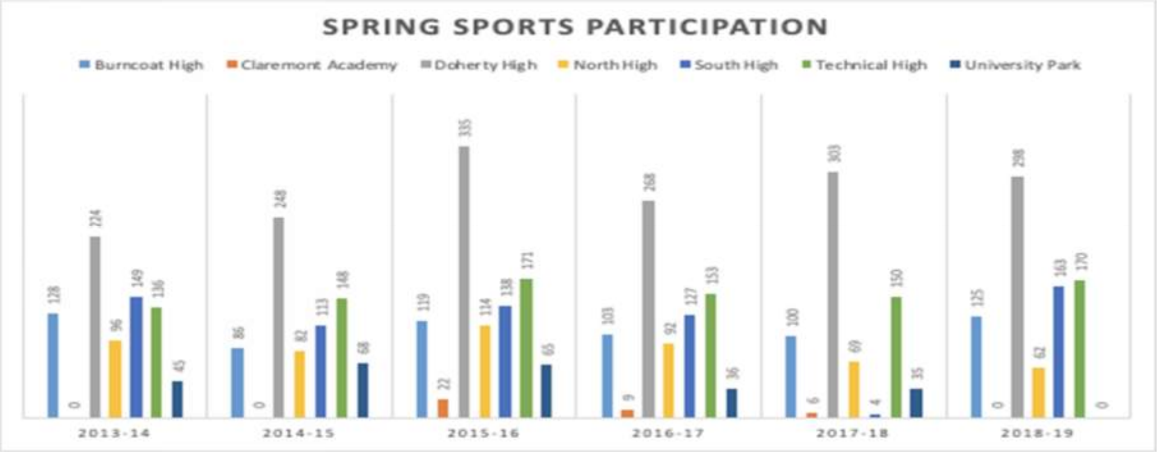


Figure 11



Several of our student-athletes have gone on to participate in athletics at the college, semi-pro, and professional levels. Among our alumni, staff members and coaches, there are many who have been inducted into the Worcester Public Schools Athletic Hall of Fame. However, our current facility does not support the athletic programming in a manner that is both desired and deserved.

The images below identify some of our recent student- athletes who went on to compete at the collegiate or professional levels.

Figure 12


WHO WILL BE THE NEXT
GREAT HIGHLANDER?
STATE CHAMPIONS
1980
2013
EVAN BRUNELLE
MIAMI
RHAKIM WILLIAMS
UCONN
AARON ADU
TEMPLE
ALFRED ADARKWAH
UMASS/WAGNER
NOAH ROBINSON
MISSOURI
YAWIN SMALLWOOD
UCONN - ATLANTA FALCONS
ISAAC YIADOM
BOSTON COLLEGE - DENVER BRONCOS

Figure 13

Adam Goldstein
Denison College

Evan Brunelle
University of Miami

Tyler Sterner
University of Rhode Island
Drafted by
Cincinnati Reds

Aaron Adu
Temple University

Jewel White
Franklin Pierce College

Wadeline Jonathas
University of South Carolina
(NCAA Champion)

Francesca Hammond
Anna Maria College

Kaiya Saunders
University of Virginia

Rahkim Williams
University of Connecticut


Noah Robinson
University of Missouri
Canadian Football League


Tavian Vassar
Bucknell University


Isaac Yiadom
Boston College
Denver Broncos


Luke Brennan
Salem State University


Yawin Smallwood
University of Connecticut
Atlanta Falcons/Tennessee Titans

During the fall season, the only team who can practice outside on our campus is the football team. This team practices on a non-regulation field that measures approximately 85 yards in length, rather than the 100 yards of a regulation football field on which they compete. The junior varsity and varsity teams practice together which is not an optimal situation. The boys' and girls' varsity and junior varsity soccer teams practice and compete at Foley Stadium and they have to walk there in order to do so. The field hockey team practices on a small patch of land outside of the stadium at Foley Stadium. It is approximately one mile from the school and having the athletes walk from school to the stadium presents an ongoing safety concern. During the fall season our student-athletes also participate in field hockey, cross-country track, boys' golf, crew, girls' volleyball, and cheerleading. During inclement weather many of these groups compete for indoor practice time as our current gym is too small for them to schedule practice simultaneously.

The issues of the inadequate size of our gym are most evident during the winter season when practice is scheduled in two-hour intervals from 2:00 p.m. until 9:00 p.m. During the winter season, our student-athletes participate in boys' and girls' varsity and junior varsity basketball, hockey, swimming, wrestling, cheerleading and boys' and girls' indoor track. From 2014 to 2018, we housed wrestling practice at our school, but that program has since been relocated to another high school within the district due to lack of space despite high rates of participation by our students. This results in the need for the team to travel for practice and competitions. The girls' and boys' track teams both practice in the gym for hurdles, high jump and shot-put but run throughout the hallways of the school as there is no track in our facility. Not only does this practice jeopardize the safety of these student-athletes, but it is also unsafe for any student and/or teacher who has remained after school to walk safely through the building as they go from one location to another or simply exit the building upon the completion of their after school extra help session or club activity. It is unsafe for the night custodians who work from 2:00 p.m. to 10:00 p.m. and/or any school plant employee who may be in the building making repairs so as not to disrupt the school day. There is a dire need for an indoor track, elevated or at ground level, that is at least 133 meters in length to be a part of the new school design to safely accommodate the large number of students, (75 last year), who participate in this sport at Doherty.

During the spring season, our student-athletes participate in varsity and junior varsity baseball and softball, boys' volleyball, tennis, boys' and girls' lacrosse, boys' and girls' crew, and boys' and girls' outdoor track. The boys' volleyball team has limited space within which to practice especially during inclement weather as the softball and baseball teams need to use the net in order to practice indoors safely and the net needs to be removed for volleyball practice and games. To install the net and up then to remove it requires 30 minutes which leads to even less time for the teams. Similar to what occurs during many of the fall sports, the student-athletes who participate in baseball, softball, lacrosse and track have to walk to Foley Stadium or to Beaver Brook Park for practice and/or be driven to other locations for practice, games and competitions. This is an ongoing safety concern. The boys' and girls' tennis teams practice at the public courts at Newton Square adjacent to the school but not on our property.

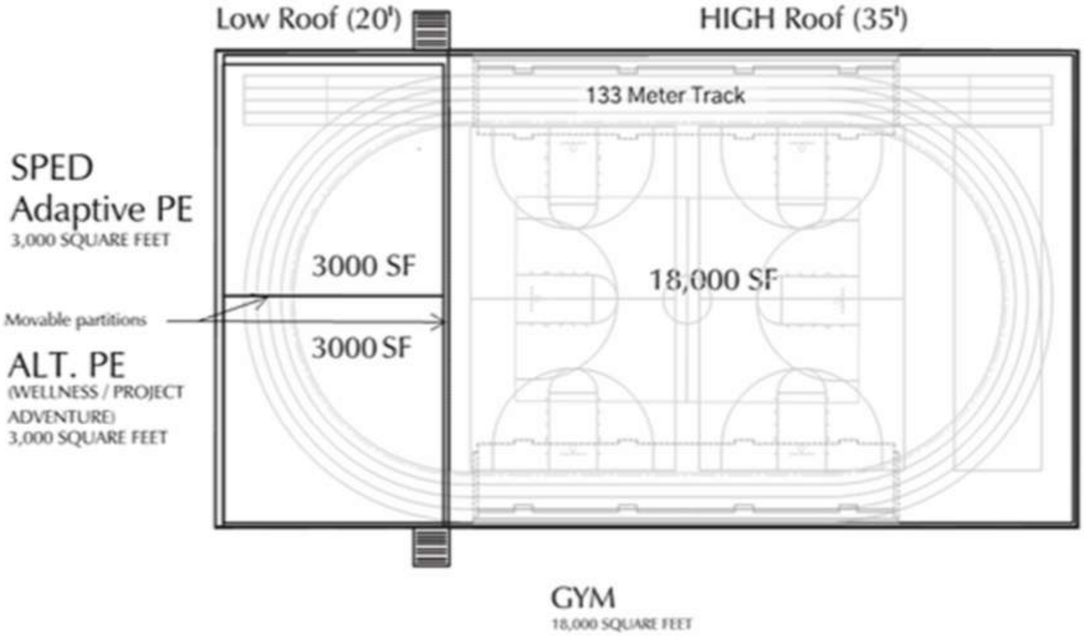
Despite these conditions, our teams have been and continue to be successful. In 2013, the football team won the state championship at Gillette stadium. That was a wonderful event for the athletes, their families, the students, and our entire school community. Our teams compete and qualify for district play in varsity sports every year and often secure winning titles.

Often, we are forced to disallow large numbers of our fans, students and family members alike, from attending our games due to the inadequate capacity of our gymnasium and the need to respect the limits needed to comply with fire code and to avoid safety concerns that result from overcrowding. Not only does this deny the school and district of much needed revenue for our sports programs, more importantly it disallows all members of our school community to gather together in order to support our teams.

Equally disappointing, when our students have qualified for home court advantage they have been forced to compete at gymnasiums located in other high schools in the district that are larger but certainly not our “home.” The boys’ basketball team has been one of the top basketball programs in central Massachusetts for the past 25 years, but they have yet to play a quarterfinal playoff game in our gym due to the attendance rules of the MIAA and the capacity of our facility. This injustice has occurred in 1997, 1998, 2008, 2010, and 2011 and our team has had to find alternate sites to “host” a home court advantage playoff game each time.

The vision for the new facility includes a space large enough for us to gather the entire school population not only for games but for assemblies and academic recognition ceremonies, guest speakers, special events and to provide trainings. There needs to be a way to secure the gym area from the academic areas of the building so it can be utilized as a community space without compromising the safety and security of the building. Currently, we are unable to secure the gym area due to the necessary fire egress so anyone who enters the gym area has access to the entire building which is a concern for the security of the school. Some of the locker room areas, the small gym area and some shower spaces have been converted to be used as a weight room with weights and equipment that have been donated from Good Sports and Planet Fitness. While we appreciate their generosity, the equipment is being used in a less than an optimal space and much of our equipment is less than state of the art. Our students deserve to have a state-of-the-art facility with proper equipment.

In the new facility, we envision our students having space for weightlifting, conditioning, adequate locker rooms for home and visiting teams with showers and white boards, and a wellness center with good sight lines to all areas to ensure the proper supervision of students. We would like to have three full courts to allow more than one team to be able to effectively practice simultaneously. Our physical education classes will also benefit from this improved space as they also need lockers, boys and girls locker rooms and access to showers. There is also a need for storage space for team equipment in addition to storage needed for the equipment used by the Physical Education teachers.



The 3,000 square-foot wellness center and the adaptive PE spaces are planned to be adjacent to the 18,000 square-foot Gymnasium, separated by modular partitions with a lower 20' ceiling. The spaces are organized to support the day-to-day Physical Education program needs within the area allotted by the MSBA. After school hours, the modular partitions may be opened to accommodate a 133-meter indoor track for track practice, for unified sports and for maximum flexibility for the overall school.

Also, we are seeking to add fields in the new facility. The football team would benefit from having a regulation field on site with lights, bleachers, and a press box that could be used for games and practices. The track program would benefit from having a track outlining the football field. The vision includes another 80-100-yard multi-purpose field to be used for soccer and field hockey during the fall season and to be used for lacrosse in the spring and the inclusion of baseball and softball diamonds with bleachers and lights. Finally, the addition of two outdoor basketball courts and two tennis courts would allow us to keep our students on campus and end the practice of having to walk anywhere which we see as a safety concern.

The physical education curriculum throughout the year allows students to explore different athletic and wellness-based activities. Students will engage with these activities, many of which will utilize age-appropriate or industry-standard equipment. When not in use, to ensure safe storage to prevent damage, as well as to provide an uncluttered space for student safety, this storeroom is critical to provide for an effective Health and Physical Education experience for all students.

All external spaces, including the fields, would be supported with WiFi access.

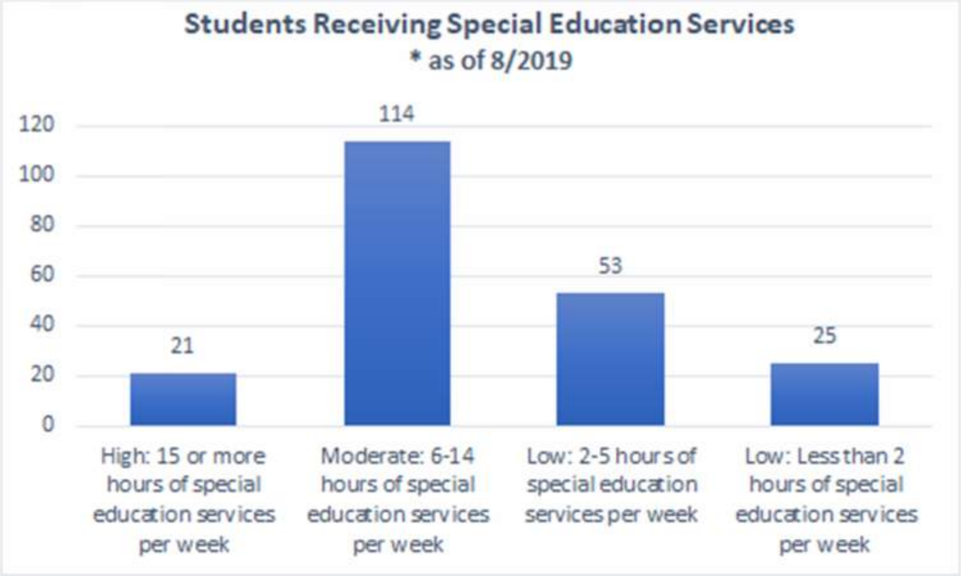
K. Special Education

The mission of the Worcester Public Schools Special Education Department is to provide support, technical assistance and service to schools, staff, students, families and community stakeholders as we work collaboratively to promote safe schools where all children learn. The department is committed to partnering with parents and schools to ensure the fidelity of specialized instruction, inclusion opportunities, professional learning and rigorous outcomes for students with disabilities. Doherty Memorial High School offers a variety of full year (1 credit) courses to support student needs to access the curriculum and to make academic progress. Students receive services in accordance with their Individual Education Plan (IEP). Some students receive classroom services in dedicated Special Education classrooms: resource class, Structured Therapeutic Education Programs (STEP), and Life Skills. Other students are served by the inclusion model (either full or partial) with support in general education classrooms. In addition, some students receive supports such Occupational Therapy, Physical Therapy, Speech and Language therapy, Learning Disability support (LD) or a combination of such supports an indicated in their IEP. Additional supports such as Adaptive Physical Education are taking place in the school's gymnasium.

The curriculum is delivered in the Special Education classrooms using varied, individualized and differentiated strategies to meet the needs of all learners. Instructional methods include whole- and small-group -instruction, modeling of strategies, use of both oral and written use of language, use of manipulatives and other hands-on learning tools, whole- and small-group discussion such as modeling read-aloud and think-aloud skills, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills. While this is the goal in all classes in the Special Education department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Students' IEPs identify specific academic and/or social and emotional needs and these students receive a specific number of hours of support as indicated in their plan. Table 15 indicates the number /hours of students receiving Special Education services as of August 2019. Disabilities currently addressed include autism, communication impairment, intellectual impairment, neurological impairment, emotional impairment, health impairment, and specific learning disability, and/or multiple disabilities. We anticipate this number to grow as the enrollment in the new Americans with Disabilities Act (ADA) compliant school increases and we are able to serve more students with identified needs.

Figure 14



In accordance with Massachusetts education laws and regulations (603 CMR 28.06) students with disabilities, to the maximum extent appropriate, are educated in the least restrictive environment (LRE) and supporting an inclusive environment for students. The Special Education classes at Doherty Memorial High School are not all located exclusively in one area of the building in order for eligible students to maximize their inclusion into the life of the school as noted in the MSBA Special Education Rubric and Regulations. While these classrooms are integrated into the general education classroom areas, they are not integrated as well as they could and should be to support the needs of our students in our current facility. Currently, students with IEPs have access to school facilities including but not limited to implement the students' IEPs. While the present resource rooms and separate classrooms for students with disabilities (STEP, Life Skills) are given the same priority as general education programs, including access to and use of instructional and other space /facilities in the school, this could be improved to better serve the expanding student population and anticipated needs of future students once when we are in the new school which will be ADA compliant.

Three of our current classrooms that are used for resource rooms are divided into two semi-separate spaces and shared by two teachers. While this may foster some level of collaboration more often it serves as a distraction for students, such as an open classroom concept would do. One of these "shared" spaces is home to two of our three STEP classrooms. The third STEP classroom (104) is located near the music and theater areas and those performances serve as a distraction to students as well.

The clinician, who is an integral member of the team to support the STEP students, is housed in an area that was converted to an office space located near, but not next to the split STEP classroom. We anticipate increasing the number of clinicians to two in the new facility. In order to truly provide support, the clinicians each need a larger space and one that is more centrally located among the current three and anticipated four STEP classroom spaces. These spaces need to be equipped with appropriate technology and be large enough to accommodate meetings with members of the Special Education department, community service providers, parents and students as well as individual and small-group counseling sessions and provide a comfortable safe-space for students in crisis.

The Life Skills students are currently housed in one of the smallest spaces in the school and must enter that space by passing through a different classroom, something that poses a distraction to both the students in the classroom and the Life Skills students. The students in this program need an expanded space to effectively meet their needs and access to additional space to successfully teach the adult learning skills.

The vision for the new school is to have intentionally placed classrooms, sufficient space and learning centers to effectively meet the academic and social emotional needs of our students. We will not add any additional programs nor will we eliminate any current programs. We will maintain the current programming but will be ADA compliant. DESE suggests that instruction group sizes be kept small (ten to twelve students) indicating a need for classrooms that are approximately one half the size of other classrooms in the building but large enough to accommodate this recommended size group with flexible seating to accommodate student and instructional needs, access to technology, using both the distributive and stationary model (desktop computers to meet student needs as identified in IEPs) and adequate storage for materials to support individualized and differentiated instruction. Additional space needs to be dedicated to accommodate the anticipated increased programming and staffing. As we move into a more inclusive model there is a need for more inclusion classrooms and collaborative learning spaces. Additionally, we need a place for the Evaluation Team Chairperson, (ETC) and for the additional clinician that we expect to add to support those students with social-emotional needs. We anticipate the number of students enrolled in our STEP program to increase necessitating the change from three to four classes given the number of students involved in this type of program currently throughout the district and across the grade levels, K-12.

A conference room is needed to hold IEP and progress meetings to engage the families, team chair, regular and special education teachers in a welcoming and private space to respect confidentiality and the integrity of the team process. A designated, private meeting area needs to be included to hold Special Education meetings with teachers, specialists, and parents. The Special Education Department head requires office space with access to technology and storage for materials to support differentiated and individualized instruction within the department.

The School Psychologist is responsible for psychological testing and evaluation students. The school psychologist, working in conjunction with members of the Special Education departments, in addition to the Evaluation Team Chair (ETC) requires a private, quiet space for testing with access to appropriate technology and meeting rooms for consultation.

Additionally, the ETC needs office/meeting space with access to technology to plan and coordinate student IEP meetings which is in close proximity to Special Education conference room/meeting space in order to facilitate meetings with teachers, school psychologist, adjustment counselors, Special Education teachers, and parents.

With the planned addition of the Grade 9 academy, there will be a need to incorporate Special Education classrooms into this neighborhood to provide appropriate support for these students. In order to support the special education needs we are planning to attach one learning center (resource room) teacher and one inclusion teacher to each of the four Grade 9 academies. For students in Grades 10-12 we plan to have a learning center specialist (resource room) and inclusion space attached to each of the four major subject areas: ELA, Social Studies, Mathematics and Science in each of the three Grades 10, 11, 12. The special education classrooms and spaces will be integrated into the core academic spaces. This model will allow for flexibility as the numbers of students receiving full inclusion or partial inclusion services change. ~~We are striving for the most inclusive environment while providing all of the support needed for success and in full compliance with all IEP's which supports the need for additional and flexible space which will allow for grouping and supports.~~ Common spaces in each of these academies/neighborhoods will be used to support small group instruction as well as pullout instruction provided by special education teachers and other Special Education staff/counselors. We envision a flexible space to provide for multiple orientations and uses, with flexible furnishings to account for current and future needs.
Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

Multiple settings for small group and individualized instruction and supports, located in the various neighborhoods and in close proximity to general education classrooms will support an inclusive environment for all students with or without disabilities and promote greater equity and access to instruction and school programs.

We are striving for the most inclusive environment while providing all of the support needed for success and in full compliance with all IEP's which supports the need for additional and flexible space which will allow for grouping and supports. To that end, the District has taken/is taking steps to support this shift to a more inclusive model of instruction. There have been several professional learning opportunities geared toward supporting the success for all students, particularly focused on the delivery of curriculum, instruction, and interventions. Training has been provided at the district and school levels to effectively meet the needs of our Special Education students. The exchange of effective strategies and practices among and between general education teachers and special education teachers is invaluable to inform their co-teaching. The district is committed to continuing to provide training to support the successful implementation of all Individualized Education Plans and to provide the necessary staff to support all Special Education programming including but not limited to inclusion specialists, behavioral specialists, and paraprofessionals necessary to remain within the regulations that govern Special Education in Massachusetts and to educate all students in the Least Restrictive Environment,(LRE).

Within each area there needs to be space designated for different levels of special education services/classrooms: full inclusion, partial inclusion, and resource classroom. These classroom spaces will be outfitted, with respect to technology and infrastructure, like all other classrooms in the building, and will follow a consistent room numbering scheme that will be identified later in the design process. Within the Special Education classrooms there needs to be space to allow for flexible grouping including areas for students who need to work one-to-one with a teacher or have a quiet space, free from distractions, to work individually in accordance with the students' IEP. Classrooms need to be equipped with appropriate furniture and equipment to support identified student needs including but not limited to flexible furniture, lavatory facilities, and accommodate spatial requirements as well as acoustical and lighting treatments to remove physical communication barriers for students who are visually impaired, deaf, or hard of hearing. The classrooms also need to have access to technology and use both the distributive technology model as well as stations with desktop computers to support student needs as indicated in the IEPs. Classrooms need to be equipped with appropriate technology including Epson bright link short throw projector, LED display is desired with screens that support both independent or mirroring displays, document camera, Chromecast/apple TV and speech reinforcement. These rooms also need to have adequate and appropriate storage for materials needed for teachers to support differentiated and individualized instruction. No specific signage identifying rooms as “resource room” or “special education’ will be used.

Learning Disabilities classrooms need to provide pull-out space, complete with access to technology, for teachers to work with students. We currently have one full-time and part-time LD teacher. With the anticipated increased enrollment in the new school, there will be a need to expand the LD supports to meet the needs of the expanding student population. As a result, an additional LD space will be needed. One such LD space needs to be located in the Grade 9

Academy neighborhood to provide academic support for these students, especially as they struggle to make the transition from middle school to high school.

There needs to be an improved space for Occupational Therapy and Physical Therapy as these services will be expanding as the new DMHS will meet ADA requirements and students whose IEPS indicate that they require these services will no longer need to attend other high schools in the district due to accessibility issues at the current building. A designated space is needed to provide Occupational Therapy for students. This area will provide services for students with identified special needs in fine and perceptual motor skills development. There is a need to support the OT specialist to provide evaluation, consultation and direct services for students. Additionally, there needs to be a space dedicated to providing Physical Therapy services for students with demonstrated special needs in gross motor development. The PT specialist provides evaluation, consultation and direct services to students in accordance to the student's IEPs. A Speech and Language therapy area/classroom is needed to allow the speech pathologist to provide speech and language therapy for students with receptive and expressive language interferences which affect their ability to make effective progress. This area needs to be able to accommodate both individual and small- group sessions. Each of these spaces (OT, PT, and Speech/Language) need to have appropriate access to technology and space for the specialist to store and secure materials.

With the anticipated increased enrollment in the new school there is a need to increase the space needed to service students with these identified needs. The Life Skills classroom needs to be fully ADA compliant with direct grade level access to outside areas to support interaction with the school's outdoor spaces which can enhance instruction through interaction with outdoor educational spaces such as the school garden.

The addition of an Adult Daily Living (ADL) Center to enhance student independence in their living and work environment is an integral part of the plan for the new school. The center would provide an area to support students in the Life Skills class that would teach skills for day-to-day living. This area would need to provide model areas where students can learn such skills as using a washer/dryer, dishwasher, stovetop, oven, and other household appliances, as well as basic work skills. While students would have the opportunity to practice work skills in the school store, the ADL would provide workstations to teach skills needed for working with cash registers, and learning skills such as sorting, folding, labeling, and packing items.

Vocational Learning Center

Vocational training provides students with the opportunity to master the skills needed in order to be successful not only in school but in life. The vision for the new facility is to design learning opportunities for our special education students to engage in real-world experiences throughout the school. The licensed staff will teach and practice the specific job-related skills during their class time and these students will utilize this knowledge both in their classroom and in a variety of locations throughout the building. For example, students may work in the school store, the offices, and help to maintain the school garden. By doing so, they will be prepared to participate in our community as they develop vocational skills needed for their futures.

Study Skills

Study Skills is a course taught by licensed Special Education teachers that is often included as a part of a student's IEP. During this class, students learn note-taking strategies, test-taking tips and skills associated with time management. These skills assist these students in their academic coursework as they are able to apply this knowledge to their other coursework with the support of a special education teacher who can clarify any misconceptions and help students to review and practice using the skills and academic concepts from their other classes. This class time can also serve to allow for extended time for academic tasks as is also often a part of an IEP.

Coping Room

The coping room, designated as the Social Emotional Learning Center, is a space where students can receive academic and social and emotional support. To be assigned to the coping room, students would have received a referral from an administrator for a certain amount of time. During this assigned interval, students would complete academic tasks as assigned by their teachers while also receiving the support and coping strategies and proactive problem-solving skills needed to successfully transition and return to their regularly assigned schedule of classes.

It is not critical for this space to be adjacent to the Media Center.

L. Vocational and Technical Programs

Chapter 74 Programming

With the proposed new Doherty Memorial High School, the Worcester Public Schools is looking to strengthen and expand the Chapter 74 offerings. A formal Chapter 74 Programming Submission was created and submitted to the MSBA.

Doherty Memorial High School currently offers an Engineering and Technology Chapter 74 Program. The goal is to offer three additional trade programs within the new design.
Table 9

Chapter 74 Program Offerings	Current Enrollment	Proposed Capacity	Comment
Engineering & Technology	380	400	Existing Program, space to be expanded
Programming & Web Development	0	200	New Program
Marketing Management & Finance	0	200	New Program
Construction Craft Laborer	0	150	New Program
Total	380	950	

Each vocational program will be available to all students from across the district. Similar to current policy, all Worcester residents in grade 8 will be eligible to apply for admission to any of these four programs. There is no plan to create a ninth-grade exploratory program. Rather, the application will ask students to identify their desired program, and if there are multiple areas of interest to then provide a ranking in order of their preference.

Engineering and Technology

The Engineering and Technology Academy (ETA) vocational program serves students from across the district, and each year has more students applying than the current space can accommodate.

The ETA vocational program was certified 10 years ago and utilizes an approach to integrate the trade skills and knowledge within the academics. Students in the ETA are teamed, meaning they share the same Engineering, Science, and Mathematics teacher. These teacher blend curriculum, cross-train skills, align standards and expectations, etc. and as such when combined the students are engaging with their vocational curriculum for 3 out of 7 periods of their day. While the vocational program calls for the integrated academics of math and science specifically, our ETA program also teams the Social Studies and English Language Arts classes, resulting in a thematic alignment for almost 70% of the students' day. There are 9th and 10th grade interdisciplinary teams. Doherty does not run a week-on, week-off schedule.

Doherty's schedule includes a 7-period day. Students in the ETA share 5 common classes together, which includes three vocational periods (out of 7) each day. Teachers, including vocational teachers, have 5 instructional classes each day, with a combined maximum student load of 125 students, per the Worcester Public Schools' contract. Due to safety considerations, some classes- including the Engineering classes-are capped so that their enrollment allows for safe access and utilization of the related shop areas. For example, all 9th grade ETA teachers have a maximum load of 100 students (5 classes x 20 students, as 20 is the maximum allowed within this vocation). Thus, at any given time there would be a maximum of 20 students working within any of the vocational or classroom spaces. Combined, there are 100 possible ETA students within each grade for a total of 400 students.

For example, a traditional 9th grade schedule would appear as follows:

Period 1 - English I
Period 2 - Geometry (integrated academics)
Period 3 - Biology (integrated academics)
Period 4 - Introduction to Engineering (vocational)
Period 5 - World History II
Period 6 - World Language
Period 7 - Health, Physical Education

During the school day, Engineering classes run simultaneously for grades 9-12. This results in 2-4 vocational classes running simultaneously during each period of the school day. Given the highly technical nature of the vocational curriculum, students are often accessing the classroom spaces- which would include computers, graphic design software, curriculum resources etc.- along with the vocational spaces each day.

During the school day, Engineering classes run simultaneously for grades 9-12. This results in 2-4 vocational classes running simultaneously during each period of the school day. Given the highly technical nature of the vocational curriculum, students are often accessing the classroom spaces- which would include computers, graphic design software, curriculum resources etc.- along with the vocational spaces each day.

The ETA program will serve approximately 100 students in each grade – up to 400 total. This comprises approximately 24% of the expected population of 1670 students. Students completing all CVTE requirements receive a technical certificate, in addition to their diploma. Given the complex content knowledge required for work in the career, our primary goal is to provide students with a strong foundation in content knowledge along with skills so that, as students enter college, they are well prepared to continue their engineering/technology education. From a review of local (Massachusetts) and national labor market projections, there is a clear demonstrable need to students to enter this profession, albeit by first earning some level of post-secondary education.

The ETA serves approximately 100 students per grade. This corresponds to a 20:1 student to teacher ratio. In the Worcester schools, teachers are assigned five classes each year, and the ETA currently has four CVTE Engineering teachers. There is no planned change to this enrollment pattern for the new school.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with four related-theory engineering classroom spaces paired with three shared laboratory spaces. Given the nature of the curriculum, each of the four related-theory engineering classrooms will require a 1:1 desktop computer to student ratio. It is necessary to have desktop computers in this area as the necessary software cannot be run on the Chromebooks. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

Within this team model, students in the ETA are also receiving vocational instruction within their science and mathematics courses. Thus, the engineering classrooms (four) and associated science and mathematics classrooms that compose the vocational program need to be adjacent to each other. These classrooms are considered related-theory classroom spaces. Based on the teaming models and other factors, the goal within this design proposal is to establish four related theory classrooms with adjacency to the engineering classrooms. Two would serve the Science integration, while two would provide space for the Mathematics.

The Engineering and Technology program's design includes three shop areas. These represent separate, albeit spatially adjacent and accessible, spaces in which different aspects of the vocational curriculum can be implemented. For example, Doherty currently has two-very undersized-shop areas. One houses typical construction and fabrication equipment, used primarily for wood-based projects, including a range of power tools, saws, sanders, drills, etc. The second shop area houses equipment such as 3D printers and fine milling machines. A third major component of the engineering curriculum includes electrical work, including analog and digital circuitry analysis, robotics, programmable logic controllers, etc. Currently, most of this work occurs in a classroom, but this requires staff to reorganize their space when this equipment is needed, e.g. moving computers to the side, setting up equipment, breaking it down each day to account for other classes coming into the space, etc.

Throughout the four years, students are interacting with varied tools and equipment as they engage with the curriculum. Some of this laboratory work is reinforced and strengthened from year-to-year, and so the engineering technology program requires multiple laboratory spaces, each outfitted to support the different skills being developed. These spaces can be accessed and shared by all educators within the program. Current industry and post-secondary trends, and as identified within the curriculum, demonstrate the need for three distinct shop spaces: one to support manufacturing and fabrication skills, such as wood-working or machining; a second laboratory space to support the electrical engineering, circuit design, robotics and programmable logic controllers, and testing; and a third to enable students to engage with 3-D printing, prototyping and CNC technologies. As industry and post-secondary trends change, these three spaces can change and be updated accordingly. During the design phase, adequate ventilation and appropriate safety measures will be provided and accounted for in all necessary spaces.

The three shop areas would allow for dedicated spaces for the three currently designed major vocational skill sets. As industry standards and technologies change in the coming decades, these spaces provide flexibility in the school's ability to deliver the curriculum to such a large population.

To promote professional collaboration and support, the four program classrooms and 3 shared laboratory spaces should be in proximity with each other. Given the numerous and varied consumable materials, tools and equipment needed to effectively implement the curriculum, each laboratory and classroom space needs appropriate storage options. Staff will need a common educator office and planning space. These program classrooms, laboratory spaces, storage and staff spaces should be designed together, and this vocational program will be adjacent to a ninth and tenth grade cluster of academic classrooms. The Engineering Technology vocational program area should also have adjacency to the proposed Construction Craft Laborer vocational program as students and staff will be able to utilize both sets of laboratory spaces as appropriate within the curriculum. In addition, the laboratory spaces should have exterior access so that large materials, machines or equipment can be delivered and stored or installed. Two of the laboratory spaces (manufacturing/fabrication space as well as the CNC space) should have dust collection systems, and shop sinks.

There are no plans to contract or discontinue the Engineering program at Doherty Memorial High School. Rather, the goal is to create a space that builds upon our existing program in this area, enables students to work safely, with up-to-date technology, and in a space that enables students to work collaboratively in a range of learning activities. The goal is also to provide space so that the class does not have to be broken into groups, each under additional supervision, or to have to identify work-around solutions to the current set of deficiencies as explained in the Chapter 74 Programming Submission.

New Vocational Programs

Doherty is currently seeking Chapter 74 approval for three programs: Programming and Web Development; Marketing, Management and Finance; and Construction Craft Laborer. For each, Doherty has begun to lay the foundation by offering introductory coursework within the curriculum. Doherty intends to add additional coursework and staff to the maximum extent possible so that each program is established as we then transition to the new space.

The three proposed programs will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in each program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed. The table below shows likely course offerings at each grade level.

Sample Student Schedule:

	Grade 9	Grade 10	Grade 11	Grade 12
CVTE Curriculum	Grade 9 CVTE	Grade 10 CVTE	Grade 11 CVTE	Grade 12 CVTE
CVTE Related Theory (RT)	Grade 9 RT	Grade 10 RT	Grade 11 RT	Grade 12 RT
English	English I	English II	English III	English IV
Mathematics	Algebra	Geometry	Algebra II	Pre-Calculus
Science	Biology	Chemistry	Human Anatomy	Physics

World Language (assume that student needs at least 2 years to be college ready)	Language 1	Language 2 (at minimum, need to start the 2 year sequence in grade 10)	Language 3 (possible)	
Social Studies	World History II	US History I	US History II	
Credit total	7 credits (full schedule)	7 credits (full schedule)	7 credits (full schedule)	5 credits
Additional elective offerings				
Art/Music/ Computer Science/ Theater, other 1 credit electives	None available (unless move language to year 2)	None available	None available	Possible options

AP Classes	AP Human Geography not available (unless move language to year 2)	AP Human Geography, AP Statistics	Some options of an AP class in lieu of their core academic requirement (e.g. AP English Language for English III).	More options available

The Worcester Public Schools anticipates hiring four new teachers to serve all students within each Chapter 74 program. This will correspond to 1 teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for each program by offering introductory courses.

Given Doherty's expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of 'shop' time followed by another period of related theory supporting the curriculum. This will correlate to one teacher per grade.

At full enrollment, Doherty will offer 4 years of vocational instruction. As an example, below shows a potential teacher schedule within this vocational program and how the space will be utilized. Each teacher will have 2 sections of their respective vocational and related theory courses.

Sample Teacher Schedule (at Year 4)

	Grade 9	Grade 10	Grade 11	Grade 12
Period 1	CVTE Curriculum (sec 1)	CVTE Curriculum (sec 1)	Additional Course	CVTE Curriculum (sec 1)
Period 2	RT (sec 1)	RT (sec 1)		RT (sec 1)
Period 3	Common Planning Time	Common Planning Time	Common Planning Time	Common Planning Time
Period 4	CVTE Curriculum (sec 2)		CVTE Curriculum (sec 1)	CVTE Curriculum (sec 2)
Period 5	RT (sec 2)	CVTE Curriculum (sec 2)	RT (sec 1)	RT (sec 2)
Period 6		RT (sec 2)	CVTE Curriculum (sec 2)	Additional Course
Period 7	Additional Course	Additional Course	RT (sec 2)	

Programming and Web Development

Students enrolled in this program will receive skills training that falls under the Professional and Tech Services industries. The program curriculum includes programming fundamentals, algorithm-based thinking, visual programming and game development, professional applications, robotics, and will include Advanced Placement coursework in Computer Science Principles as well as Computer Science A.

The Programming and Web Development program anticipates serving ~~200~~ 160 students-approximately ~~50~~ 40 students per grade. This corresponds to approximately ~~12%~~ 9.6% of the expected population of 1670 students. Chapter 74 regulations outline a 20:1 student to teacher ratio as a maximum. In the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 20:1 ratio, educators within the Programming and Web Development program will not exceed this maximum student load.

Per Massachusetts DESE Chapter 74 policy, “a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student.” Further, this program-related instructional time could be comprised of ‘shop’ time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty’s expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of ‘shop’ time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, Programming and Web Development program will include 4 classroom/laboratory spaces. Each space will include 1:1 desktop computers, as industry-standard software programs supporting this curriculum are not supported on Chromebook devices.

The Programming and Web Development program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Programming 1 and Related Theory 1, and a 10th grade student will enroll in Programming 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 - English III
Period 2 - Pre-Calculus
Period 3 - AP US History
Period 4 - Programming and Web Development 3
Period 5 - Prog. and Web Dev. Related Theory 3
Period 6 - World Language
Period 7 - AP Physics 1

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to 1 teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for this program by offering introductory courses in Information Technology. With the addition of one teacher for 2019-2020 school year, Doherty students can capitalize off their skills and industry knowledge as the program gains momentum.

A team, supported by the Programming and Web Development Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

As part of this curriculum sequence, students will partner with district Information Technology personnel to gain practical knowledge and skills. The new school design will include space to house computer-support devices, servers, network hubs, and related technological infrastructure. Students within this trade program will learn about the varied hardware and software within, and exterior tools that support the school. District IT personnel will be able to train students as they maintain and service the technological infrastructure. During their academic and vocational coursework, students within the Programing and Web Development course will therefore gain valuable career readiness skills from current professionals.

It is traditionally difficult to use high-school interns due to the commute time for interns to travel to the networking office. By housing the school networking infrastructure at Doherty interns from the vocational program would be able to work with IT during the school day as well as afterschool, thereby receiving real world experience troubleshooting issues as they occur. Students would gain experience in IP addressing, network troubleshooting wireless spectrum analysis, user account maintenance, and more.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with four combination laboratory space/classrooms. Given the nature of the curriculum, each laboratory space will require a 1:1 desktop computer to student ratio. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

To promote professional collaboration and support, the four program classrooms/laboratory spaces should be in proximity with each other. These four classrooms can be supported with a centralized storage room as well as a common educator office and planning space. While these program classrooms, storage and staff spaces should be designed together, there is then no required adjacency to any other program within the school.

The Programming and Web Development program proposal seeks four classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers.

Construction Craft Laborer

The Construction Craft Labor pathway provides training for all students in all areas of the construction field, including carpentry and framing, rigging, blueprint reading, and masonry. Students will work with all types of hand tools, power tools to build projects.

The Construction Craft pathway provides hands on training for students in the Construction Industry with opportunities to work in the fields of carpentry, construction, masonry, and tile setting, among others.

Skills training received in this program fits the Construction Industry and Occupations. These occupations (so called 'hard trades') include Apprenticeship trades, high employer need and engagement, strong wages and require little formal education and therefore present low barriers. Workers in these trades are often affiliated with organized labor unions and employer sponsored associations offering apprenticeship opportunities leading to post-secondary education and portable industry credentialing. Additionally, as evidenced by the employer survey conducted for the Central MA Regional Blueprint, entry level laborer is the number one occupation facing significant employee/candidate shortages.

The Construction Craft Laborer program anticipates serving ~~150~~ 120 students-approximately ~~35-40~~ 30 students per grade. This is close to ~~9%~~ 7.2% of the expected population of 1670 students. Chapter 74 regulations outline a 15:1 student to teacher ratio as a maximum. In the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 15:1 ratio, educators within the Construction Craft Laborer program will not exceed this maximum student load.

The Construction Craft Laborer program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Construction 1 and Related Theory 1, and a 10th grade student will enroll in Construction 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 - English III
Period 2 - Pre-Calculus
Period 3 - US History 2
Period 4 - Construction 3
Period 5 - CCL Related Theory 3
Period 6 - World Language
Period 7 - Physics

The Construction Craft Laborer program proposal seeks two classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers. In addition, the shop area will enable students to transfer theory to practice within this versatile space.

Per Massachusetts DESE Chapter 74 policy, “a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student.” Further, this program-related instructional time could be comprised of ‘shop’ time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty’s expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of ‘shop’ time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, the Construction Craft Laborer program will include four related-theory classroom spaces as well as a common shop space for the practice and development of physical skills.

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to one teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. In preparation for the development and expansion of this program, Doherty Memorial High School has begun offering courses that align with some of the vocational standards, especially those within Strand 4 (Employability and Career Readiness Knowledge and Skills) and Strand 5 (Management and Entrepreneurship Knowledge and Skills). For example, the school is now offering College and Career Readiness courses that, in part, enable students to "participate in a variety of experiences that will assist them in the development of personal, academic and career/vocational skills." For the 2019-2020 school year, Doherty Memorial High school hired personnel to offer and expand these elective course offerings to students. This course curriculum will serve as the foundation for students entering the Construction Craft Laborer program.

A team, supported by the Construction Craft Laborer Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

The minimum required laboratory space for a class of 15 students is 3375 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with ~~four combination laboratory space/classrooms~~ two shared classroom spaces, two teacher offices, and one large shared laboratory space. Given the nature of the curriculum, each ~~laboratory space would require~~ traditional classroom space~~,~~ would allow~~ing~~ students to engage in group work, perform calculations, learn related theory, etc. This space would also support the student use of available, existing Chromebook technology. The adjacent laboratory space would then enable students to acquire practical skills within the trade. Given the varied range of tools and equipment, along with the varied project, hands-on work expected within the curriculum, the laboratory space will need to be versatile. Laboratory spaces will require shop sinks. During the design phase, adequate ventilation and appropriate safety measures will be provided and accounted for in all necessary spaces.

The Construction Craft Labor is the only program proposed that requires a shop ceiling height greater than a typical classroom. Layout efficiency will be considered when locating this shop within the building.

To promote professional collaboration and support, the ~~four-program classroom/laboratory spaces~~ two shared classroom spaces, two teacher offices, and one large shared laboratory space should be in proximity with each other. Given the numerous and varied consumable materials, tools and equipment needed to effectively implement the curriculum, each laboratory and classroom space needs appropriate storage options. Staff will need a common educator office and planning space. These program classrooms, laboratory spaces, storage and staff spaces should be designed together, and this vocational program should be adjacent to the Engineering Technology vocational program area, as students and staff will be able to utilize both sets of laboratory spaces as appropriate within the curriculum. In addition, the laboratory spaces should have exterior access so that large materials, machines or equipment can be delivered and stored or installed.

There is no redundancy in trade programs within Doherty, i.e. no duplication of equipment, tools, or space. For example, several other vocational schools who implement the Construction Craft Laborer program also implement a range of other construction trades, including carpentry, welding, HVAC etc. For example, Medford Vocational Technical High School currently implements the Construction Craft Laborer vocational program for students. Medford also offers vocational programming in related trades including Carpentry, HVAC, and Metal Fabrication and Joining Technologies. These programs, including their equipment, staff, and space, are able to mutually support each other. Medford, and other similar schools, rather than duplicating the space and equipment needs for Construction Craft Laborer and the other trades, have the option to work collaboratively to share the available resources. For example, when students in the Construction Craft Laborer program focus on the development of their welding skills, they are able to utilize the equipment and laboratory space in the Metal Fabrication and Joining Technologies program.

In contrast, the New England Laborers, in conjunction with the Cranston, RI Public Schools, designed and built the Construction Career Academy. In 2002, this facility opened and implements the RI vocational construction craft curriculum. As a stand-alone facility, with no other related shop spaces offering mutual support, almost 7200 square feet is dedicated to the effective implementation of the curriculum.

With the current and proposed CVTE programs for Doherty Memorial High School, there are no related shop areas that would allow for shared spaces and/or equipment. With Doherty's current and anticipated bell schedule, there would be times throughout the day where multiple Construction Craft Laborer classes are simultaneously being run. Each individual class would be limited to 15 students, but with a total planned enrollment of ~~150~~ 120 students there would likely be multiple needs for the classroom and related shop spaces.

Therefore, Doherty is planning for a shop space larger than the minimum 3375 square feet. The 4 associated related-theory classrooms would have adjacency to this shared shop space. The planned common shop space will encompass approximately 5000 square feet. The perimeter of this shop will include stations, with each focusing on a different skill set and providing space to utilize the equipment associated with that facet of the trade. As there are no redundant programs elsewhere in Doherty, these stations will be designed and equipped to ensure the needs of all vocational curriculum standards and competencies will be met.

While there are no related areas for the Construction Craft Laborer students to utilize, there would be ample opportunities for other school and community programs to benefit from the skills, equipment, space, and practical experiences of the Construction Craft Laborer program.

Marketing, Management and Finance

We currently offer CTE courses in Marketing and Business Doherty Memorial High School offers full year (1 credit) courses in Marketing I and II, Exploring Business Systems, Introduction to Business Systems and Accounting, all of which are scheduled for a 1-period block. In these courses students gain an overview of business operations and acquire computer application and presentation skills, learn essential communication skills applied to business development, entrepreneurship, management, career development and employability.

We are seeking to expand this CTE pathway to be approved as a Chapter 74 Marketing, Management and Finance CVTE certified program. CVTE programs can have a range of benefits including higher rates of college enrollment, and enhanced career skills and increased earnings as indicated by labor market research. The vision for the new building is to continue to grow these programs in a space with access to technology and hands-on opportunities for students to increase their understanding of the field.

This proposed vocational program provides skills training that fits with the Retail/Hospitality industry, which combined is the region's second largest employment sector (19.5%). Marketing has evolved with the changes that the internet has brought to business. Professionals working in the marketing industry must be well rounded in sales, management, advertising, customer service, cultural diversity, and both qualitative and quantitative analysis. While no nationally-recognized credential is available for these skill sets, students can earn the following industry recognized credentials:

- Occupational Safety and Health Administration (OSHA) – Ten-hour General Industry
- Certification • National Retailers Federation Customer Service Certification

The Marketing, Management and Finance program anticipates serving ~~200~~ 160 students, or ~~50~~ 40 students per grade. This corresponds to approximately ~~12%~~ 9.6% of the expected population of 1670 students. Chapter 74 regulations outline a 20:1 student to teacher ratio as a maximum. In the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 20:1 ratio, educators within the Marketing, Management and Finance program will not exceed this maximum student case load.

The Marketing, Management and Finance program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Accounting 1 and Related Theory 1, and a 10th grade student will enroll in Marketing and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 10th grade schedule would appear as follows:

Period 1 - English II
Period 2 - Geometry
Period 3 - US History 1
Period 4 - Marketing I
Period 5 - Marketing Related Theory 2
Period 6 - World Language
Period 7 - Chemistry

Per Massachusetts DESE Chapter 74 policy, “a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student.” Further, this program-related instructional time could be comprised of ‘shop’ time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty’s expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of ‘shop’ time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, the Marketing, Management and Finance program will include ~~four~~ three classroom/laboratory spaces. Each space will include 1:1 desktop computers, as industry-standard software programs supporting this curriculum are not supported on Chromebook devices. Students will transfer these skills from the classroom to practical settings. The goal within this design process is to develop a School Store that supports students and builds culture, but that also empowers students as the School Store will be managed by students within this trade. Similarly, as the program curriculum is developed and sequenced, the advisory team will expand the outreach and practical application opportunities for these students further into the school and community. For example, vocational students can oversee some of the logistical operations within the Doherty Cafe.

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to one teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for this program by offering introductory courses in Accounting and sections of Introduction to Business. With the hire of 1 teacher for this coming school year, Doherty students can capitalize off their skills and industry knowledge as the program gains momentum.

A team, supported by the Marketing, Management and Finance Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with ~~four~~ three combination laboratory space/classrooms and two shared teacher offices. With the inclusion of the school store, students will be able to share the classroom spaces with the store as an extension of their shop space. Given the nature of the curriculum, each laboratory space will require a 1:1 desktop computer to student ratio. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator’s desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

To promote professional collaboration and support, the ~~four~~ three program classrooms/laboratory spaces should be in proximity with each other. These ~~four~~ three classrooms can be supported with a centralized storage room as well as a common educator office and planning space.

In addition, students will benefit from shared spaces within the Visual Arts department, for example as they design displays within their Marketing classes. The store will provide a space to account for many school needs, and students will be able to coordinate and supply these needs. For example, the store will provide a venue to offer school-branded merchandise for students, families, and community members. This will provide real-world opportunities to apply their vocational skills as they design the products and related advertising, as well as have opportunities to interact with peers and adults in a professional atmosphere.

In addition, one of the goals of the vocational program is to provide opportunities for students to experience practical applications of the curriculum. This will be accomplished through vocational internships or coops in the community for students in the upper grades, but will include in-school opportunities as well. The Marketing, Management and Finance vocational program should have an adjacency to, or be in proximity with, the proposed school store. Students will be able to manage all aspects of this store, such as budgets and financial transactions, inventory control, marketing and awareness campaigns, personnel tracking, etc. In addition, the new Doherty design includes a cafe, and this provides another school-based, student-centered and led enterprise.

CTE and College/Career Pathway Programming

Television Production

Doherty Memorial High School currently offers a CTE programming pathway in Television Production. Doherty’s Television (DTV) program offers students a 2-year sequence of courses. At this time, the DTV studio consists of a repurposed closet and storage room, along with a portion of a subdivided classroom. The current television studio at Doherty High School is approximately 350 square feet of renovated closet and storage space. The space is split into 2 rooms. There is a 225 square foot recording studio with insufficient overhead lighting and a green/blue backdrop unit for chroma-key recording. The second room, approximately 125 square feet, is used for editing. There are currently four desktop computers installed with power director software. The class utilizes 3 small Sony HD video cameras, a 4k Sony video camera, and two DSLR still cameras. All of the computers and cameras were obtained via fundraising, either in school or through community and crowd-funding based platforms. There has not been any funding of this equipment or studio since its last major upgrade in 2010.

The proposed new school facility would include a modernized space for students to engage with the curriculum. A modernized Television Production studio should include a space for film editing, enhancements, and would house computers and other specialized production equipment. Adjacent to this is the film studio. In addition, the space would have desks/chairs/tables for student use as they collaborate, conduct academic discourse, plan their productions and segments, receive journalism and production instruction, and engage in other varied learning activities. Current Massachusetts DESE Chapter 74 guidelines states that a Radio and Television Broadcasting vocational program would have a minimum space of 2500 square feet, providing 125 square feet of space for each of the 20 students working within the program. While

Doherty's Television Production programming pathway is not vocational, these DESE guidelines provide a sound baseline when designing a modernized, industry-standard program. Ideally, this studio would be located adjacent to the media center with green/blue screen capabilities and updated HD or 4K cameras, communication and recording equipment, desktop computer editing software, and the ability to broadcast throughout the school through multiple display areas.

Computer Science

The Massachusetts Curriculum, Frameworks for Digital Literacy and Computer Science state that "digital literacy and computer science knowledge, reasoning, and skills are essential both to prepare students for personal and civic efficacy in the twenty-first century and to prepare and inspire a much larger and more diverse number of students to pursue the innovative and creative careers of the future. The abilities to effectively use and create technology to solve complex problems are the new and essential literacy skills of the twenty-first century" (p.7). These frameworks focus on four key domains: Computing and Society, Digital Tools and Collaboration, Computing Systems, and Computational Thinking. Students gain proficiency by integrating practices necessary to succeed in an ever-increasing technological world.

Doherty Memorial High School offers full year (1 credit) courses. The current 1-credit course offerings include Computer Science I, Computer Science II, and Introduction to Computer Programming and Advanced Placement Computer Science Principles, all of which are scheduled for a 1-period block. All of these Computer Science course offerings are non-CVTE electives. During the 2018-2019 school year, there were three sections of AP Computer Science Principles scheduled, serving a total of 70 students. Doherty will also offer the AP Computer Science A course during the 2019-2020 school year.

The Computer Science department is currently a part of the Mathematics Department. There are two rooms predominantly utilized for computer science courses and while these classrooms are adjacent to each other, they are not in close proximity to the majority of the mathematics classes. Both computer science classrooms have desktop computers, and the number of computers is maximized based on the safe availability of electrical connections. It is necessary to have desktop computers in order to utilize the programming software which cannot be supported on the Chromebooks. There are also a set of tablet-arm chairs available in each classroom, as non-computer science courses also are offered in these spaces due to the current lack of available classroom space for other courses.

Neither computer science classroom is designed to effectively support a 21st century STEM curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. The computers are arranged on the perimeter walls, based on the pre-existing locations of the electrical outlets. Most students are not able to monitor the teacher's work, demonstrations, etc. without being able to face their desk and/or device.

Currently, Computer Science classes are sometimes taught by Mathematics teachers, as these staff members tended to have skill sets and/or licensures in both areas. However, the Mathematics Curriculum Framework (2017), as well as the Digital Literacy and Computer Science Curriculum Framework (2016) are distinct curricula and with the coming inclusion of Computer Science as a graduation requirement, coupled with its growing popularity, DMHS may choose to group the Computer Science teachers into their own department. The Vocational Programming and Web Development program teachers will be organized within the larger CVTE department, and not within the Computer Science and/or Mathematics department(s).

DMHS has a seven-period day, with no rotation or dropped periods. Each classroom is then available for use for seven periods each day. Therefore, there are fourteen instructional periods available in a room outfitted to some degree to support a computer science/programming curriculum.

During the 2018-2019 school year, there were two FTE staff members. Most teachers within the department provided computer-based instruction, though one had a general, non-departmentalized elective course as part of their assignment. In total, these staff provided a combined ten instructional periods of mathematics and general electives. In addition, there were several other non-mathematics classes scheduled into these rooms, due to the available space. For the 2018-2019 school year, these twelve 'computer' rooms had a combined usage rate of 86% (twelve used periods out of fourteen available periods).

With the addition of new staff members to the department this year, and the addition of new courses, there is a lack of available classroom space within the computer science area, requiring classes to be scheduled in available rooms outside of the department area. This poses additional scheduling challenges as certain courses require specific software necessitating the use of desktop computers. As enrollment increases and the department continues to grow with additional staff and course offerings, the school will be challenged to find appropriate classroom space to meet these needs

The vision for the computer science courses in the new building includes additional classrooms with advanced technology to support changes and trends in the growing field of computer science. With the anticipation of computer science becoming a graduation requirement in Massachusetts in the near future, there is a need to include flexibility to add more classes and have additional staff to meet this need. This will require consideration in the planning to meet the technical and electrical needs to support the expansion of this department and the ability to make changes to meet the advances in this rapidly growing field.

Innovation Pathways Program (IPP)

The Innovation Pathways Program was developed to help expand career field exploration through technical education within the Worcester Public Schools. Students participating in the program will experience an in-depth look at a career field of their interest; work towards industry recognized credentials in that area; engage in college and career planning activities; and gain experience through a summer internship or a capstone project. Worcester Public Schools has worked with many organizations and businesses to develop a program that meets the needs and interests of students as well as future labor market demands. We are proud partners with: MassHire Central Region Workforce Board, One8 Foundation, and the Worcester Regional Chamber of Commerce and Business Partners. The IPP coordinator will need an office space to meet with students in the new school design.
(Appendix C)

Dual Enrollment/Early College

Students who wish to pursue advanced or specialized courses beyond those offered at the school may take courses at area colleges including Assumption College, Becker College, College of the Holy Cross, Quinsigamond Community College, and Worcester State University. With our district's participation in Early College, our students have additional opportunities to take courses through Quinsigamond Community College and Worcester State University both at the college campus locations and at our own school. The Early College/Dual Enrollment Coordinator will require an office space in the new facility. (Appendix D)

Internships/Community Service

During the 2019-20 school year, we have been fortunate to add a full-time internship coordinator to our staff. The addition of this position has allowed us to expand the learning opportunities for students to extend beyond the walls of our school and beyond the school day. This teacher is responsible for developing and monitoring our students who are involved in internship opportunities that vary in nature, throughout our community. Additionally, although many members of our staff help to engage our students in community service projects, the addition of this position allows us to have a central location within which to organize and schedule this type of community involvement while increasing the breadth and depth of our participation. Currently, there is an office space afforded for this purpose in order to meet with students and we envision an office space in the new facility.

Virtual High School (VHS)/Edmentum

Consistent with our school and district's mission statements, the mission of the Virtual High School is to provide students and teachers with collaborative and engaging learning opportunities and the vision is to prepare students to be successful in college, careers and life. Students and teachers at our school participate in the virtual high school program and have been involved in this program for many years. Virtual High School allows our students to participate in courses that we may not offer at our school and/or to take a course online that may not have been able to fit into their schedule. Students who participate in these courses receive support their progress is monitored by our staff. Similarly, our students use the Edmentum online platform to engage in coursework for which they may need to recover credits and/or need additional time for course mastery. Participation in this online learning helps students to achieve academically and contributes to college and career readiness. Currently, the he online learning coordinator has an office space in order to meet with students and will need office space in the new facility in order to be able to continue to offer online options for our students.

M. Description of Core Academic Educational Activities

Table 10

English Language Arts	ELA is a graduate requirement in the Worcester Public Schools and all students in Grades 9-12 take ELA each year. Students will gain mastery of a range of skills and applications so that they can read, comprehend and analyze increasingly rigorous literary texts representing a variety of genres, cultures, and perspectives. They will draft and edit clearly written and logically organized arguments, informative/explanatory, critical, comparative, and analytical essays, and narratives using evidence from texts and for a range of purposes, emphasizing clear, logical writing patterns; word choice; a variety of rhetorical strategies; and use of literary conventions and stylistic devices. Students utilize technology to research, write and publish their work. They participate in large- and small-group collaborative discussions and use the conventions of the English language correctly. Journalism and Creative Writing are offered as elective classes. Academic Literacy is a support class for students who need a double dose of ELA. Students who excel in the subject and have an interest in exploring literature and honing their rhetorical skills are encouraged to participate in AP Language and Composition and /or AP Literature and Composition.

Mathematics	Math is a graduate requirement in the Worcester Public Schools and all students in Grades 9-12 earn four credits in mathematics including Algebra 1, Geometry, and Algebra 2. The mathematics program provides opportunities for all students to interpret and persevere in solving real world, complex mathematical problems using strategic thinking. Students will be effective communicators and collaborators who construct viable arguments and critique the reasoning of others in order to make decisions, draw conclusions and solve problems. The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole- and small-group instruction, collaborative activities, hands-on, project-based lessons, modeling of strategies, integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom space often impacts the ability two fully implement these strategies/activities on a more frequent basis. Technology is integrated into the curriculum and students make use of graphic calculators, and Chromebooks to support individual and collaborative activities. Upper level classes such as Statistics allow students to apply the problem solving skills they have acquired to real-life situations and focus on probability, analyzing numerical data, statistical studies, using recursion in models and decision making, using functions in models and decision making, decision making in finance, and networks and graphs. Courses such as AP Statistics, AP Calculus AB and AP Calculus BC rely incorporate technology such as graphing calculators and challenge students to learn through discovery.

Science	Three credits of Lab Science are a required graduation requirement for all students. Courses provide students with opportunities for in-depth exploration of the standards identified in the Massachusetts Curriculum Frameworks. The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, procedures and experimentation, whole- and small-group discussion, collaborative activities, project-based exploration of topics, laboratory experimentation, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis. Students in lab science classes will conduct lab investigations, collect and analyze data, and explore content information from a variety of texts and media sources. Students who have a deeper interest in exploring specific aspect of science may opt to take Human Anatomy, AP Biology, AP Chemistry, AP Environmental Science and/or AP Physics. Science courses utilize dedicated laboratory space, flexible seating/grouping, as well as collaborative laboratory activities, small- and large-group class discussion and modeling of procedures, and results. Teachers incorporate technology into their classes as students use computers for research, collaboration and sharing.

Social Studies	Three credits in Social Studies (World History II, United States History I and II) are required for graduation. The Social Studied department has high expectations that all students will understand the political, social, economic, historical and legal developments throughout human history by guiding them to be critical thinkers, analytical readers, thoughtful communicators and independent learners. Educational activities implemented in the department include but are not limited to the use of differentiated instructional, whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion including Socratic Seminars and debates, collaborative activities, project-based learning activities, and the integration of technology to support research skills, analysis of historical perspectives and cause and effect. These skills build upon critical reading (texts and primary and secondary source documents, charts, maps, and visuals) and thinking skills. Students are asked to analyze documents in order to prove their thesis in Document Based Questions (DBQ). Cross-disciplinary collaboration between Social Studies and English departments support the use of these skills. Students may choose to take one of the social studies electives: Legal Aspects, Psychology, and Sociology. Advanced Placement courses engage students in advanced-level course work. Students may elect to take AP World History, AP US History, AP Human Geography, AP Government and Politics, and AP Psychology. These classes build upon the skills presented in earlier courses and add to the levels of discourse, reading and writing.
World Language	The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners and to support the use of the target language. Instructional methods include whole-and small-group -instruction, modeling of strategies and oral and written use of the target language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to research the culture and history of the countries associated with the target language and to practice speaking and listening skills using Audacity, a multi-track audio editor and recorder.

English Language Learners	The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners as they develop English fluency. Instructional methods include whole-and small-group -instruction, modeling of and oral and written use of the English language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills While this is the goal in all classes in the ELL department, limited classroom space often impacts the ability two fully implement these strategies/activities on a more frequent basis. EL Students access the curriculum in content area classes taught by teachers Sheltered English Immersion certification who use a range of strategies to support EL students in content area classes .Students also participate in Language and/or Literature Labs A, B, C, or D taught by certified EL teachers who employ instructional strategies to support and increase student abilities in the four domains: speaking, listening, reading, and writing.

Special Education	Special Education students are engaged core academic curriculum and are assigned a faculty advocate and scheduled into the appropriate classes as indicated in their IEP. The curriculum is delivered using varied, individualized and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, use of both oral and written use of language, use of manipulatives and other hands-on learning tools, whole- and small-group discussion such as modeling read-aloud and think-aloud skills, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills. Inclusion students receive support from a certified Inclusion teacher in their general education classes. Study Skills class supports students in the use of individualized and differentiated strategies to support their ability to access content area curriculum. Students in the STEP classes engage in small group and individualized instruction using a variety of individualized and differentiated strategies in accordance with their IEPs. Technology is integrated into lessons and classroom activities are guided by the district's High Quality Reading Writing, and Discourse document. Resource classrooms use individualized and differentiated strategies along with scaffolded instruction to support students' ability to access the curriculum that meets their needs as identified in their IEP. Life Skills students work with dedicated and certified Life Skills teachers practicing the four domains of language acquisition: speaking, listening, reading and writing as well as in problem solving and numerical skills.

Coordinated Program Review

The last Coordinated Program Review for the Worcester Public School was on September 9, 2016, September 28, 2016 and October 21, 2016 (see Appendix E).

Core Academic Educational Activities/Outdoor Connections

Doherty Memorial High School utilizes all of its space, both inside the building and outside the building to support learning opportunities for all students. Some of the student-centered clubs and activities utilize outdoor space throughout the year to engage students and help them to form life-long connections with outdoor activities and interactions with nature. Doherty's Outdoor Club engages students in a variety of activities such as hiking, camping, and snowshoeing. The Envirothon Team is a hands-on environmental problem-solving competition for high school-aged students. Students in this group complete training and testing in five natural resource categories: i.e., soils/land use, aquatic ecology, forestry, wildlife, and current environmental issues. Students are involved in our school/community garden. In past years, vegetables grown in the garden have been shared with community members and with our own food service program.

The vision for the new school is to increase the use of outside space to support both curricular and extracurricular activities. During the visioning sessions involving members of the school and community, several members discussed the importance of students having access to outdoor spaces, including the opportunity to engage in classwork or learning activities outside. This could include having the science classes come out to the field to measure biodiversity, art students finding inspiration or capturing scenes from the community, theatrical productions or open-air stages affording differing venues for productions, and provide opportunities for other classes, groups, clubs, athletic teams, and community organizations to occupy this versatile space. Currently, we have a very active outdoor club and our Envirothon team is award winning and would benefit from and help to maintain this space along with those students who are active in community service.

Students in the Life Skills class will have access to outdoor space through a grade level entry. This will prove access to the garden which can be used as a teaching tool to support skills learned through the ADL Center. Other classes, such as science classes can also benefit from access to the garden as will classes in the Visual Arts department.

To support this need, the design of the new Doherty Memorial High School will include an exterior amphitheater style space, including a flat stage or production area. This exterior space will be supported by audio/visual technologies, including a large exterior projection screen, and the capacity to connect with microphones/speakers. A mobile projection cart can be brought to the space to support the needs of these varied organizations. The use of this projector/outdoor screen would be incorporated into all types of educational programming including core academic learning activities, student performances, and project presentations such as the ETA Learning Fairs, athletics, community building activities, and community use. Outdoor space with tables and seating would allow classes and clubs to access the grounds and to meet outside.

A Typical Day in the Life of a Student

Table 11

Activity or Subject	**Program Details and Educational Benefit*** Refer to descriptions of core academic educational activities
Free Breakfast	All students are eligible to participate in the breakfast program at school at no cost to the students or their families.
Period 1	Core Academic or Elective Class
Period 2	Core Academic or Elective Class
Period 3	Core Academic or Elective Class
Period 4	Core Academic or Elective Class
Lunch	All students are eligible to participate in the lunch program at school at no cost to the students or their families.
Period 5	Core Academic or Elective Class
Period 6	Core Academic or Elective Class
Period 7	Core Academic or Elective Class
After-School	Students may participate in extra help /tutoring sessions, clubs, activities and/ or sports

Clubs and Activities

Doherty Memorial High School offers a range of clubs and activities to support student interests. Clubs are student-driven and are supported by volunteer faculty advisors. Clubs meet after school in different areas of the school. Depending upon the specific activity.

The vision for the new school includes space for student clubs to meet after-school in safe, supervised areas of the building. Since most of these activities occur after the school day designated meeting areas which would allow for supervision, access to restrooms, phones and technology would benefit these activities and help to support student involvement in their school. Students should be able to exit the building easily after participation in a club without having to walk through the entire building to reach the exit.

Some clubs and activities occur later in the day or early evening at the school indicating a need for meeting space close to the main entrance of the building. Storage space for club materials would benefit the groups as would a dedicated area to promote/advertise upcoming meetings and events. A calendar board or interactive screens dedicated to clubs and activities displayed in prominent spaces throughout the building (main foyer, cafeteria, media center, gym, and academic neighborhoods/academies).

Some of the student-centered clubs have included the outdoor club and the community garden. Outdoor space with tables and seating would allow clubs to access the grounds and to meet outside.

Clubs and Activities

Table 12

Anime Club	Highlanders Who Code	Stand for the Silent
Book Club	Humanities Scholars Collaborative	Student Council
Chorus*	Jazz Band*	Student Wellness Club
Class Officers	Madrigals*	Student Workroom
College Success Institute	Math Team	Superintendent's Student Advisory
Community Service	Meditation Club	Theater Club
Cultural Dance	Mock Trial Team	UNICEF Club
DTV*	Model UN	United Nations Club
Envirothon	Musical	Vex Robotics
First Knights Chess Club	National Honor Society	Weightlifting Club
Food Drive	Outdoor Club	Yearbook*
Gamers Club	PEACH Club	Yoga Club

Gay/Straight Alliance	Peer Tutors	Zumba Club
Girls Inc. Leadership Academy	Ski/Snowboard Club	*taken as a class

A Typical Week in the Life of a Student

Doherty Memorial High School operates on a seven-period day schedule with no variations. Every class meets every day.

Advanced Placement Course Enrollment Doherty Memorial High School

Table 13

	2015	2016	2017	2018	2019	2020 (Approximate)
Total # AP Students	299	286	337	432	468	unknown
Number of Exams Administered	554	482	561	722	805	741
Number of Courses Offered	18	18	20	20	20	22

Table 14

Student Enrollment Per AP Course						
	2015	2016	2017	2018	2019	2020
Art History (District-Wide)	1	2	5	2	3	1
Biology	82	52	70	105	74	47
Calculus AB	19	25	27	25	21	13
Calculus BC	14	12	10	27	31	24
Chemistry	17	22	17	32	Course not offered	8
Chinese	Course not offered	Course not offered	2	Course not offered	Course not offered	Course not offered
Computer Science A	2	4	9	6	Course not offered	5
Computer Science Principles					70	76
English Language and Composition	66	65	44	76	45	75

English Literature and Composition	64	60	23	40	32	33
Environmental Science	50	14	16	14	54	102
Human Geography	Course not offered	Course not offered	44	83	98	71
Physics 1	37	16	40	45	74	46
Physics 2	37	16	39	45	74	Course not offered
Psychology	55	61	50	57	67	61
Research	Course not offered	Course not offered	Course not offered	Course not offered	14	1
Seminar	Course not offered	Course not offered	Course not offered	22	16	6
Spanish Language and Culture	18	16	14	12	16	18
Statistics	25	53	33	31	29	38
Studio Art: Drawing Portfolio	15	10	20	19	20	25
United States Government and Politics	18	12	19	26	23	16

United States History	23	26	66	42	43	23
World History	11	15	11	13	12	13
Economics	Course not offered	Course not offered	Course not offered	Course not offered	Course not offered	49

N. Transportation Policies

The Worcester Public Schools offers transportation (bus) services to eligible students. Based on geographical and population distributions, Worcester is broken into quadrants. Students, based on their address, are assigned to a comprehensive ‘home’ school. Students who live 2.0 or more miles away from their assigned home school are provided, without a fee, bus services. Students under the 2.0-mile limit are responsible for getting to and from school.

Students seeking to attend a comprehensive school other than their home school are able to apply for special permission. If granted this permission, students are required to provide their own transportation, even if their address is more than 2.0 miles from the school.

All students with a driver’s license are currently able to receive a parking sticker, without a fee, and park on campus. All parking lots are at, or over, capacity and therefore are available on a first-come, first-served policy. The number of students requesting parking stickers is steadily increasing, and in the near future the school administration will likely consider identifying and implementing selection criteria to better manage the limited parking spaces.

Doherty currently has one vocational program, and all eighth-grade students across all Worcester districts are eligible to apply for admission to this program. With the MSBA proposal, Doherty is working to add three additional trade programs. If successful, all Worcester students will again be eligible to apply for admission. Any student enrolled in a vocational program is provided bus transportation for as long as they remain in the program, and as long as they live 2.0 or more miles from the school. This policy extends to students from across the district.

With our current academic programming, including one vocational program serving students from across the district, and based on fairly steady population density and housing rates, the school has required nine large buses and five small buses to service the transportation needs of the students. This has remained steady for the past three years, and increased from eight and four respectively. These figures will certainly increase as new vocational programs, as well as the advanced academy, become available. Similarly, the location of a potential new school would have ramifications for the transportation needs of the students.

Per their IEP or 504 plan, eligible students are also provided transportation services. Based on the individual needs and circumstances, these students are provided door-to-door transportation via small bus routes.

In total, 681 students were provided transportation services during the 2018-2019 school year.

At this time, there are no planned changes to the Worcester Public Schools' transportation policies. However, the school's final location and educational programming decisions may/will impact the transportation needs of the students in attendance.

O. Functional/Spatial Relationships

There are several functional and spatial relationships and adjacencies that we envision as important to the design and program development for the new/renovated Doherty Memorial High School. We have highlighted some of the priority areas below.

- The ninth-grade academies to be located adjacent to one another in a "neighborhood" in order to provide the necessary additional support to these students as they transition to high school. Each academy and team of teachers associated with the academy will have a common space to support increased collaboration, project-based learning, and interactive learning experiences.

- The Medical Suite to be located near the Principal's office in order to be able to support the nurses when needed.

- The English Language Arts and Social Studies department areas, serving students in grades 10-12, to be adjacent and share a common area, "neighborhood", in order to foster interdisciplinary connections in the humanities.

- The Mathematics and Science, Technology and Engineering department areas serving students in grades 10-12, to be adjacent and share a common area, "neighborhood", in order to foster interdisciplinary connections in STEM/STEAM.

- The Performing and Visual Art areas, “neighborhood”, to be close in proximity to support the comprehensive Art program and to foster collaboration and be equally accessible to all students and staff.

- The gymnasium, the auditorium, and the cafeteria to be used not only by all students and staff, but also to be a community space for use after school hours that can be secured from the academic areas of the building.

- Special education classrooms/learning centers to be distributed and integrated throughout our fully handicapped accessible, ADA compliant, new/renovated facility.

- The Media Center, with the desired Maker Space, to be centrally located ensuring equitable access to all students and staff.

Building Systems

The design and construction of the new Doherty Memorial High School will include and reflect modern technologies, energy efficiencies, sustainable practices, and supportive infrastructure.

The mechanical system design for the school will reflect the needs identified above. The facility will be fully air-conditioned. Using gas as a primary energy source, the school will be supported by high-efficiency Lochinvar gas boilers. The boiler will be centrally located and include overhead, garage door style access. The school will include full mechanical system controls with easy to access systems. The roof will be accessible through a walkout access door, not a ladder.

The school’s plumbing needs will reflect current best practices. Students, staff and visitors will have access to gender neutral bathrooms utilizing low water urinals. The kitchen will have grease traps with easy cleanout capacity, and the facility will have oil separator traps with easy cleanout access.

Students, staff and visitors will have access to restroom facilities. Throughout the building and into key community spaces, the design will include numerous gender-neutral restroom facilities to support the needs of all in the building, as well as sets of male/female restrooms. In key spaces, the facility will provide personal shower capacity.

Doherty Memorial High School, seeking to implement sustainable and environmentally friendly practices, will install water stations throughout the building. These will allow for direct water access as well as a faucet for students, staff, and visitors to refill water bottles as needed.

To support an efficient facility, the electrical system will incorporate smart technologies and energy efficient options. The school will have fully controllable LED lighting. Staff will be able to raise and lower the auditorium lighting, e.g. light bars, thereby removing the need for a lift to replace bulbs. A generator providing back-up power will be stored on site.

P. Security and Visual Access

Security and visual access requirements are currently implemented at Doherty Memorial High School. There are approximately 55 working cameras that are strategically placed throughout the school building, an increase from 20 cameras from the 2017-2018 school year. The cameras are located in hallways, the cafeteria, several sections around the parking lot, and several of the school's many entrance/exit doorways. The cameras are monitored in two administrative offices. There is a camera and electronic unlocking system, which includes a microphone and speaker feature, at the main entry door to the building. The main office staff has access to this camera and can provide access to visitors and students. Despite the number of functional cameras, there are numerous sections of the building for which there is no security coverage. The current layout of the building includes many 90-degree turns and mid-corridor doorways that limit visual access.

The WPS has standardized district-wide on the use of Genetec for video surveillance as well as AXIS brand surveillance cameras. The district will provide proprietary specifications information for these products in the Schematic Design submission. This standardization allows the WPS to reduce on-going training for staff and lower maintenance costs and maintenance timeframes for hardware.

The design for the new building includes plans that all interior circulation and major spaces will have camera surveillance, as well as the outside perimeter around the school and in the parking lot, thereby providing full saturation of the campus. With the increased size of the new building, its expected student and staff utilization during non-school hours, and its increased public access and use, there will be the need for thorough state-of-the-art camera and security systems to cover all areas of the building and campus. Video surveillance cameras will be a combination of fixed view, panoramic and pan-tilt-zoom (PTZ). Camera location and required view will dictate the camera type. A conduit to be provided for cameras around athletic fields and locations not directly attached to the main structure such as parking garage/overhang.

The physical layout of the building design should eliminate blind spots under stairwells, so a dedicated camera is not required. Infrastructure for cameras at all locations should be provided, even if the funding is not in place immediately. Monitoring stations will be provided for the main office, SRO office, principal office and assistant principal offices.

The main office and principal's office will have a large format display connected to the surveillance system for monitoring of multiple camera feeds at once. Remote access to the camera feeds may be granted via the main Genetec system. The intent is to provide login access for Police Department to access the security system, per the existing Memorandum of Understanding (MOU). Data storage will be required for all camera footage capable of storing a minimum of 33 days of video. Server hardware will be required to process the archiving of all camera footage to data storage.

The access point to the school will be separated by an entrance corridor to the main office and will be monitored and controlled by personnel in the main office. This main building entrance will be adjacent to the main office and within a line of sight to the office. Access through these doors will be controlled via a video intercom/intelligent door controller connected to the district's main access control system and will be controlled via main office staff. Entry will be allowed to the school through exterior and interior vestibule doors at the start of the school day. After the start of school, the interior vestibule doors will be locked.

A door from the vestibule will provide direct access to the main office through the use of a video intercom and an intelligent door control unit that is tied into the district's main access control system and is controlled by the main office staff. All visitors, during and after school, must go through the main office to access the school. After school, access to the building will also be through the main office.

All exterior doors, along with portions of Information Technology spaces, will utilize an electronic card access. The IT spaces housing the Main and Intermediate Distribution Frames (MDF and IDF respectively), the storage space, as well as the Support Specialist Office/Meeting spaces will be accessible via an electronic card access.

Across the district, the Worcester Public Schools is standardizing on the utilization of access cards, as opposed to key fobs, to leverage existing ID and timecard printing standards being used district-wide. If a card is lost the access rights to that card can be terminated. All exterior entrances will have a card reader to allow and log access. Critical facility locations (such as data closets and server room) will have a card reader to allow and log access. An added benefit to the ID access card protocol is that card reader access will be controlled centrally based on schedule or cardholder permissions.

Effective P.A. and phone communication systems is vital between all classes, laboratories, shops, and community spaces. This will be accomplished with a telephone/intercom system that allows direct calls to be made from one school space to another. In addition, the laboratory/shop spaces will include a visual cue when an incoming call is made. Often the noise levels in these spaces can prevent the staff member from hearing the intercom or call: a visual, such as a flashing light, in addition to the ring will ensure that all rooms can be contacted.

All classrooms and general spaces will include digital clock displays. These will have the capability of broadcasting messages, for example an emergency notification, when needed.

All communications (including bell system which is tied into phone) will be on emergency power generators. All phones in classrooms will have capabilities (with access code) to call out and to page. The Worcester Public Schools' standard is the Shoretel/Mitel voice-over-ip phone system and phones. The district will provide proprietary specifications information for these products in the Schematic Design submission. In addition, each classroom to have two emergency call switches, which opens a direct speaker from classroom to office.

Per existing code, a repeater system/signal booster will be provided for police and fire communications. Both Worcester Police and Fire Departments are recommended to use the same frequency for this DAS "repeater" system.

The design of the new school allows for vehicular access around the full perimeter of the building. Bollards, planters or a more welcoming design feature that provides similar security protections are desired at the front entry. To discourage after-hours access to the athletic fields by vehicles, the design calls for the potential use of bollards, gates or similar features will be used as deterrents.

The Worcester Fire department prefers that no key is required to access the grounds.

Appropriate representatives from various first responding emergency agencies, e.g. Worcester Fire, Worcester Police, and Worcester Emergency Management personnel, will be consulted in the planning process and associated requirements will be incorporated into the preferred solution.

Principals update and review the emergency response plan every year and train all faculty members. A minimum of two times a year, Doherty Memorial High School faculty and students participate in a mock light lock down and a full lock down. All district schools have adopted and implement the ALICE Model (Alert, Lockdown, Inform, Counter, and Evacuate) when responding to a crisis. Additionally, all administrators have In Force 911 installed on their cell phones which provides a means to contact all emergency personnel in the city within seconds should an emergency situation warranting that action were to occur. Principals and the school-based emergency team lead the faculty in practicing a medical emergency drill. Doherty High participated in their last Medical Emergency Drill on August 26, 2019.

Beginning in the 2015-16 school year, a School Resource Officer (SRO) was assigned to the building to support a safe and secure school environment. Doherty Memorial High School has one School Resource Officer (SRO) who is employed by the Worcester Police Department, as a police officer and is trained in the national SRO model of teacher/mentor/law enforcement triangle. The SRO requires a private office within the school to conduct mediations or meetings with parents, the SRO may also use a conference room when necessary. The goal of the SRO is to establish positive relationships with students and faculty, to monitor and deter altercations in the cafeteria and hallways, and as a last resort to engage in an incident. The SRO works closely with school administrators and utilizes a community policing method to build positive relationships with students. However, the staff and teachers at Doherty High have the primary responsibility to intervene during in-school disputes.

The SRO currently has an office near the first-floor assistant principals' offices.

Our vision for the new school is to place the SRO’s office on the first floor adjacent to the principal’s office. The office needs to provide space for the officer to meet in private, with administrators, students, and families. The office will need access to technology as well as a separate and secure phone line.

Audio/Visual

Doherty currently has a variety of audio/visual and projection equipment throughout the building. Over the years, several classroom spaces have been outfitted with wall or ceiling mounted projectors. The school has acquired approximately 24 carts outfitted with a projector and a document camera. These carts are shared between all staff throughout each day.

The communal spaces, including the library, cafeteria, auditorium, and gymnasium have no wired infrastructure to support audio capabilities, such as speakers or microphones. Instead, the school has a portable unit that is brought to the location. Power, microphone and speaker cords are run along the floor and/or wall and typically are taped down or covered with a carpet swatch for safety purposes. The speakers and amplifier set-up are not fully compatible with the physical layout of the varied spaces; therefore, the audio technology’s efficacy is limited.

The goal within a new facility is to provide effective, up-to-date technological access for all stakeholders - students, staff, district personnel, and community members - within all rooms and spaces in the school. Classroom spaces would include Epson bright link short-throw projectors, document cameras wired for use, Chromecast/Apple TV capacity, speech reinforcement technologies, and flat-screen televisions or monitors available for varied (independent or mirrored) displays in and around classrooms. Communal spaces, including the cafeteria, auditorium, library, common or meeting rooms, would have similar projection capacity, and the larger presentation spaces will provide audio technologies, including speakers, podiums, microphones, etc.

Like any facility utilizing technology, the school will require space to store equipment along with a space to maintain or repair damaged devices. The proposed design includes an Information Technology Office serving many purposes: students will learn alongside district IT personnel as the professionals service the school network; the IT professionals have a dedicated workspace that enables collaboration; a computer network storage room; as well as a storage and maintenance space. The proposal is to utilize the IT storage and maintenance space in a dual capacity - serving the IT as well as the audio/visual needs of the school.

Conclusion

It is our hope that throughout this document we have been able to capture and communicate to you, the commitment, collaboration, community, culture and climate of our school and that you will support our desire to establish a new and more suitable home for the Doherty family and for our surrounding community. We are grateful to the MSBA to have been given this opportunity. As Jim Rohn states, “Whatever good things we build end up building us” and it is our hope that the new building will support the programs we will offer and help us to prepare our students to be capable and contributing members of our community, both locally and globally.

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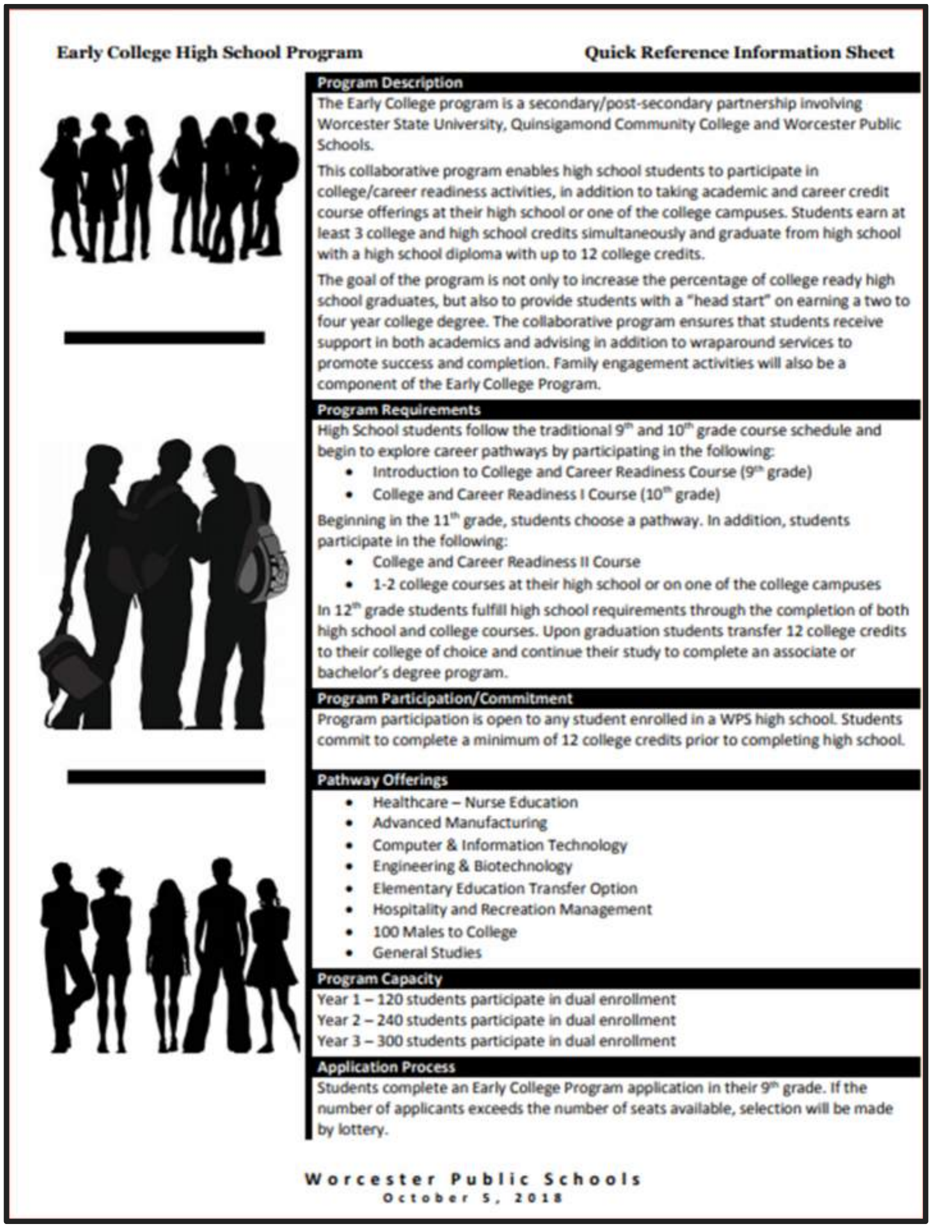
APPENDIX

Appendix A: Refer to Section 3.1.2.D.4

Appendix B



Early College High School Program **Quick Reference Information Sheet**

Program Description

The Early College program is a secondary/post-secondary partnership involving Worcester State University, Quinsigamond Community College and Worcester Public Schools.

This collaborative program enables high school students to participate in college/career readiness activities, in addition to taking academic and career credit course offerings at their high school or one of the college campuses. Students earn at least 3 college and high school credits simultaneously and graduate from high school with a high school diploma with up to 12 college credits.

The goal of the program is not only to increase the percentage of college ready high school graduates, but also to provide students with a "head start" on earning a two to four year college degree. The collaborative program ensures that students receive support in both academics and advising in addition to wraparound services to promote success and completion. Family engagement activities will also be a component of the Early College Program.

Program Requirements

High School students follow the traditional 9th and 10th grade course schedule and begin to explore career pathways by participating in the following:

- Introduction to College and Career Readiness Course (9th grade)
- College and Career Readiness I Course (10th grade)

Beginning in the 11th grade, students choose a pathway. In addition, students participate in the following:

- College and Career Readiness II Course
- 1-2 college courses at their high school or on one of the college campuses

In 12th grade students fulfill high school requirements through the completion of both high school and college courses. Upon graduation students transfer 12 college credits to their college of choice and continue their study to complete an associate or bachelor's degree program.

Program Participation/Commitment

Program participation is open to any student enrolled in a WPS high school. Students commit to complete a minimum of 12 college credits prior to completing high school.

Pathway Offerings

- Healthcare – Nurse Education
- Advanced Manufacturing
- Computer & Information Technology
- Engineering & Biotechnology
- Elementary Education Transfer Option
- Hospitality and Recreation Management
- 100 Males to College
- General Studies

Program Capacity

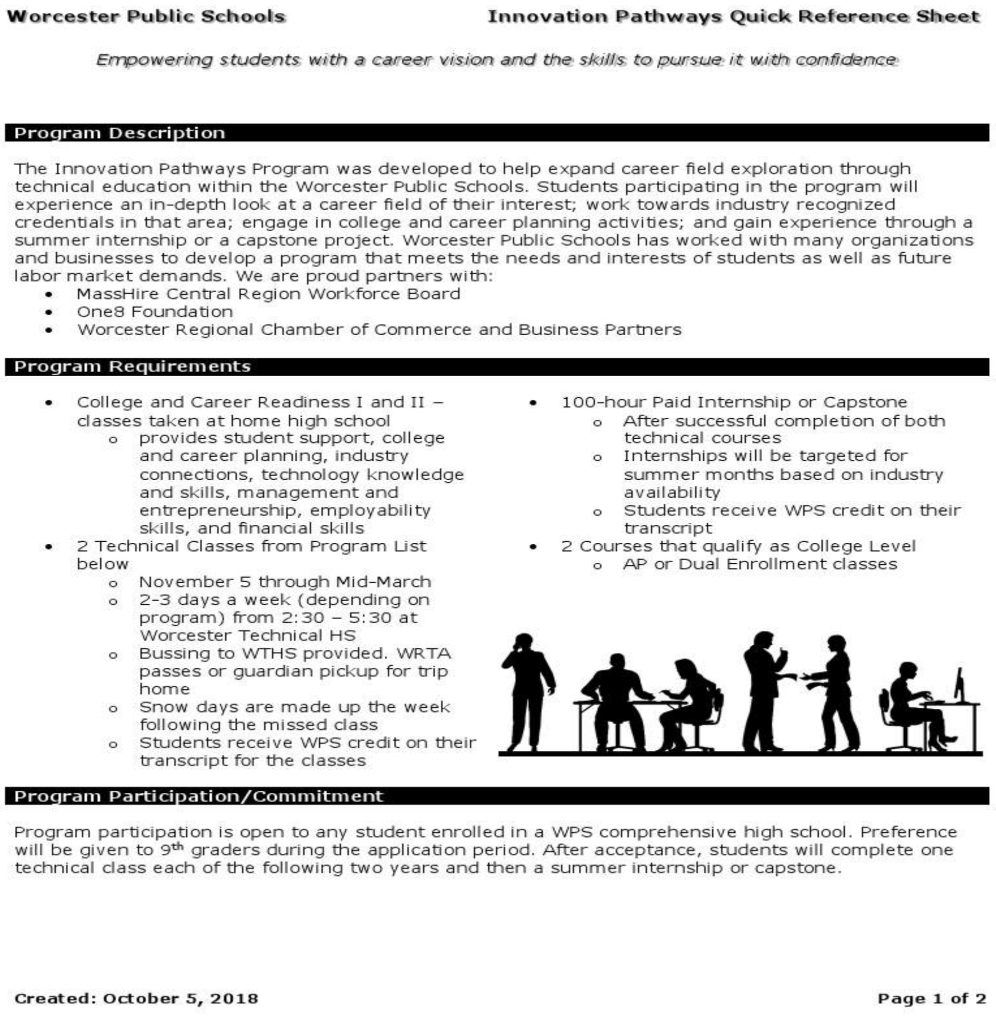
Year 1 – 120 students participate in dual enrollment
Year 2 – 240 students participate in dual enrollment
Year 3 – 300 students participate in dual enrollment

Application Process

Students complete an Early College Program application in their 9th grade. If the number of applicants exceeds the number of seats available, selection will be made by lottery.

Worcester Public Schools
October 5, 2018

Appendix C



Worcester Public Schools **Innovation Pathways Quick Reference Sheet**

Empowering students with a career vision and the skills to pursue it with confidence

Program Description

The Innovation Pathways Program was developed to help expand career field exploration through technical education within the Worcester Public Schools. Students participating in the program will experience an in-depth look at a career field of their interest; work towards industry recognized credentials in that area; engage in college and career planning activities; and gain experience through a summer internship or a capstone project. Worcester Public Schools has worked with many organizations and businesses to develop a program that meets the needs and interests of students as well as future labor market demands. We are proud partners with:

- MassHire Central Region Workforce Board
- One8 Foundation
- Worcester Regional Chamber of Commerce and Business Partners

Program Requirements

- College and Career Readiness I and II – classes taken at home high school
    - provides student support, college and career planning, industry connections, technology knowledge and skills, management and entrepreneurship, employability skills, and financial skills
- 2 Technical Classes from Program List below
    - November 5 through Mid-March
    - 2-3 days a week (depending on program) from 2:30 – 5:30 at Worcester Technical HS
    - Bussing to WTHS provided. WRTA passes or guardian pickup for trip home
    - Snow days are made up the week following the missed class
    - Students receive WPS credit on their transcript for the classes
- 100-hour Paid Internship or Capstone
    - After successful completion of both technical courses
    - Internships will be targeted for summer months based on industry availability
    - Students receive WPS credit on their transcript
- 2 Courses that qualify as College Level
    - AP or Dual Enrollment classes

Program Participation/Commitment

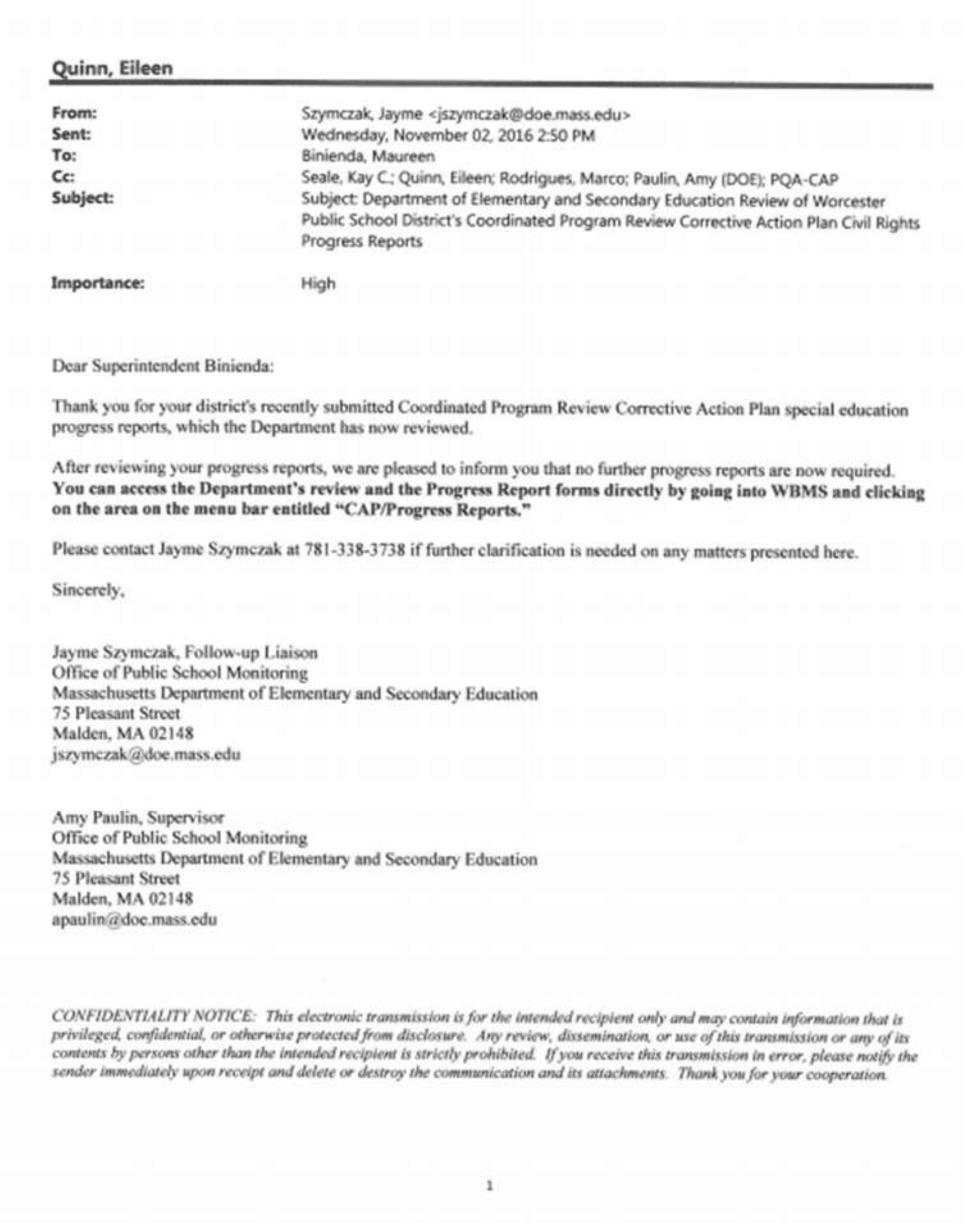
Program participation is open to any student enrolled in a WPS comprehensive high school. Preference will be given to 9th graders during the application period. After acceptance, students will complete one technical class each of the following two years and then a summer internship or capstone.

Created: October 5, 2018 **Page 1 of 2**

Appendix D Family and Community Guide

https://worcesterschools.org/wp-content/uploads/2018/07/wps_family-guide-and-community_resources.pdf

Appendix E Coordinated Program Review



Quinn, Eileen

From: Szymczak, Jayme <jszymczak@doe.mass.edu>
Sent: Wednesday, November 02, 2016 2:50 PM
To: Binienda, Maureen
Cc: Seale, Kay C.; Quinn, Eileen; Rodrigues, Marco; Paulin, Amy (DOE); PQA-CAP
Subject: Subject: Department of Elementary and Secondary Education Review of Worcester Public School District's Coordinated Program Review Corrective Action Plan Civil Rights Progress Reports

Importance: High

Dear Superintendent Binienda:

Thank you for your district's recently submitted Coordinated Program Review Corrective Action Plan special education progress reports, which the Department has now reviewed.

After reviewing your progress reports, we are pleased to inform you that no further progress reports are now required. **You can access the Department's review and the Progress Report forms directly by going into WBMS and clicking on the area on the menu bar entitled "CAP/Progress Reports."**

Please contact Jayme Szymczak at 781-338-3738 if further clarification is needed on any matters presented here.

Sincerely,

Jayme Szymczak, Follow-up Liaison
Office of Public School Monitoring
Massachusetts Department of Elementary and Secondary Education
75 Pleasant Street
Malden, MA 02148
jszymczak@doe.mass.edu

Amy Paulin, Supervisor
Office of Public School Monitoring
Massachusetts Department of Elementary and Secondary Education
75 Pleasant Street
Malden, MA 02148
apaulin@doe.mass.edu

Additionally, Refer to section 3.1.2.D.9 & 10

Appendix F: Refer to 3.1.2.C Chapter 74 Program

Chapter 74 Programming Submission

Appendix G: Refer to 3.1.2.D.11

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Massachusetts Department of
Elementary and Secondary Education

75 Pleasant Street, Malden, Massachusetts 02148-4906

Telephone: (781) 338-3000
TTY: N.E.T. Relay 1-800-439-2370

Jeffrey C. Riley
Commissioner

October 7, 2019

Mary Pichetti
Director of Capital Planning
Massachusetts School Building Authority
40 Broad Street, Suite 500
Boston, MA 02109

Dear Ms. Pichetti:

The Worcester Public Schools have notified the Department of Elementary and Secondary Education ("DESE") of their intent to offer Chapter 74 Career/Vocational Technical Education (CTE) programs as part of a new facility at Doherty Memorial High School, which is the subject of a feasibility study being conducted in collaboration with the Massachusetts School Building Authority as part of its school construction grant program.

DESE staff members have reviewed the District's Chapter 74 Programming Submission received via the Massachusetts School Building Authority. The information included plans for continuing and expanding existing programs, as well as for adding new programs.

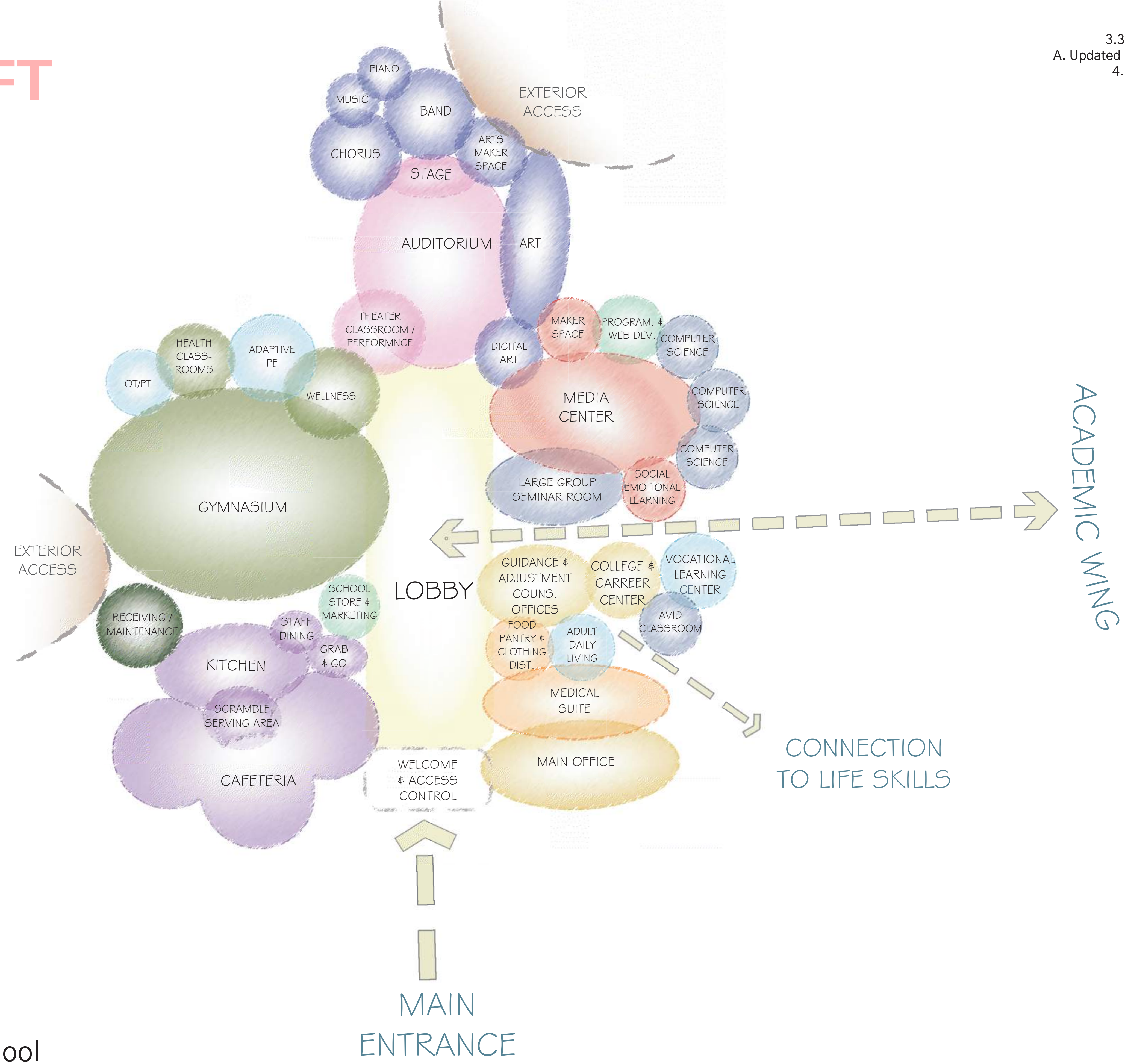
Chapter 74 Program Offerings	Comments
Engineering	Expansion of existing program
Computer Programming and Web Development	New program
Construction Craft Laborer	New program
Marketing	New program

Note that the purpose of this letter is not to grant formal or final approval for these Chapter 74 programs, but to certify that the district has consulted with local stakeholders and analyzed labor market information during the initial planning stages of the new school building, and that DESE is in general agreement with their proposal going into the next phases of the project.

Sincerely,

Cliff Chuang
Senior Associate Commissioner, Educational Options, DESE

Cc: Jeff Wulfson, Deputy Commissioner, DESE
Judith Klimkiewicz, Management Consultant for Strategic Planning for CCTE, DESE
Marnie Jain, CCTE, DESE
Larry DeSalvatore, CCTE, DESE
Lisa Sandler, CCTE, DESE
John Jumpe, Director of Project Management, MSBA
Diane Sullivan, Director of Program Management. MSBA
Katie DeCristofaro, Capital Program Manager, MSBA
Katie Loeffler, Capital Program Manager, MSBA
Rebecca Whidden, Project Manager, MSBA
Jess Deleconio, Project Manager, MSBA
Allison Jones, Senior Project Coordinator, MSBA
Matthew Deninger, DESE Commissioner’s Designee, MSBA Board of Directors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HEALTH CLASS-ROOMS
ADAPTIVE PE
OT/PT
WELLNESS
MEDIA CENTER
COMPUTER SCIENCE
COMPUTER SCIENCE
GYMNASIUM
LARGE GROUP SEMINAR ROOM
SOCIAL EMOTIONAL LEARNING
ACADEMIC WING
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LOBBY
GUIDANCE & ADJUSTMENT COUNS. OFFICES
COLLEGE & CARREER CENTER
VOCATIONAL LEARNING CENTER
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STAFF DINING
AVID CLASSROOM
KITCHEN
GRAB & GO
FOOD PANTRY & CLOTHING DIST.
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CONNECTION TO LIFE SKILLS
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WELCOME & ACCESS CONTROL
MAIN OFFICE
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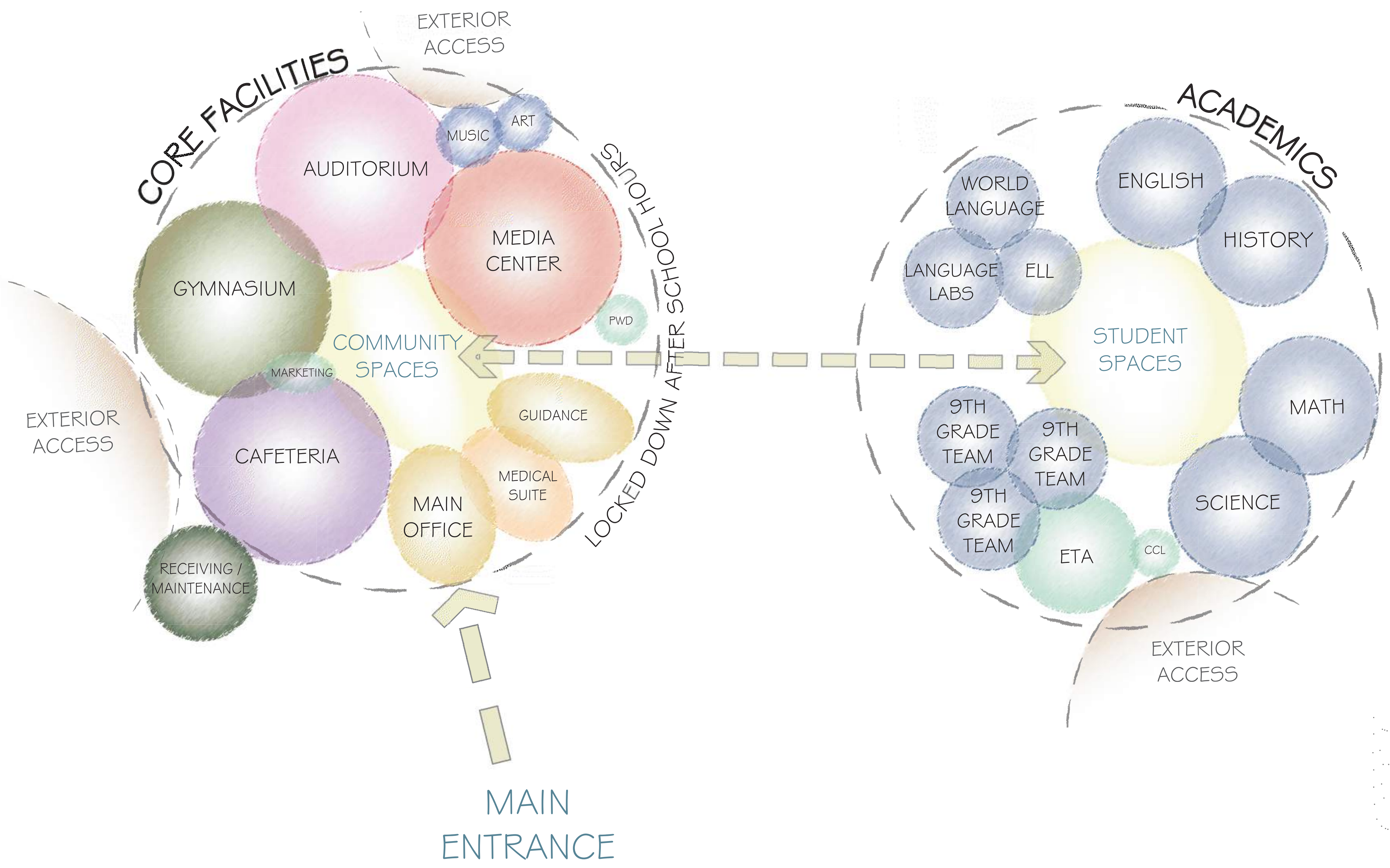
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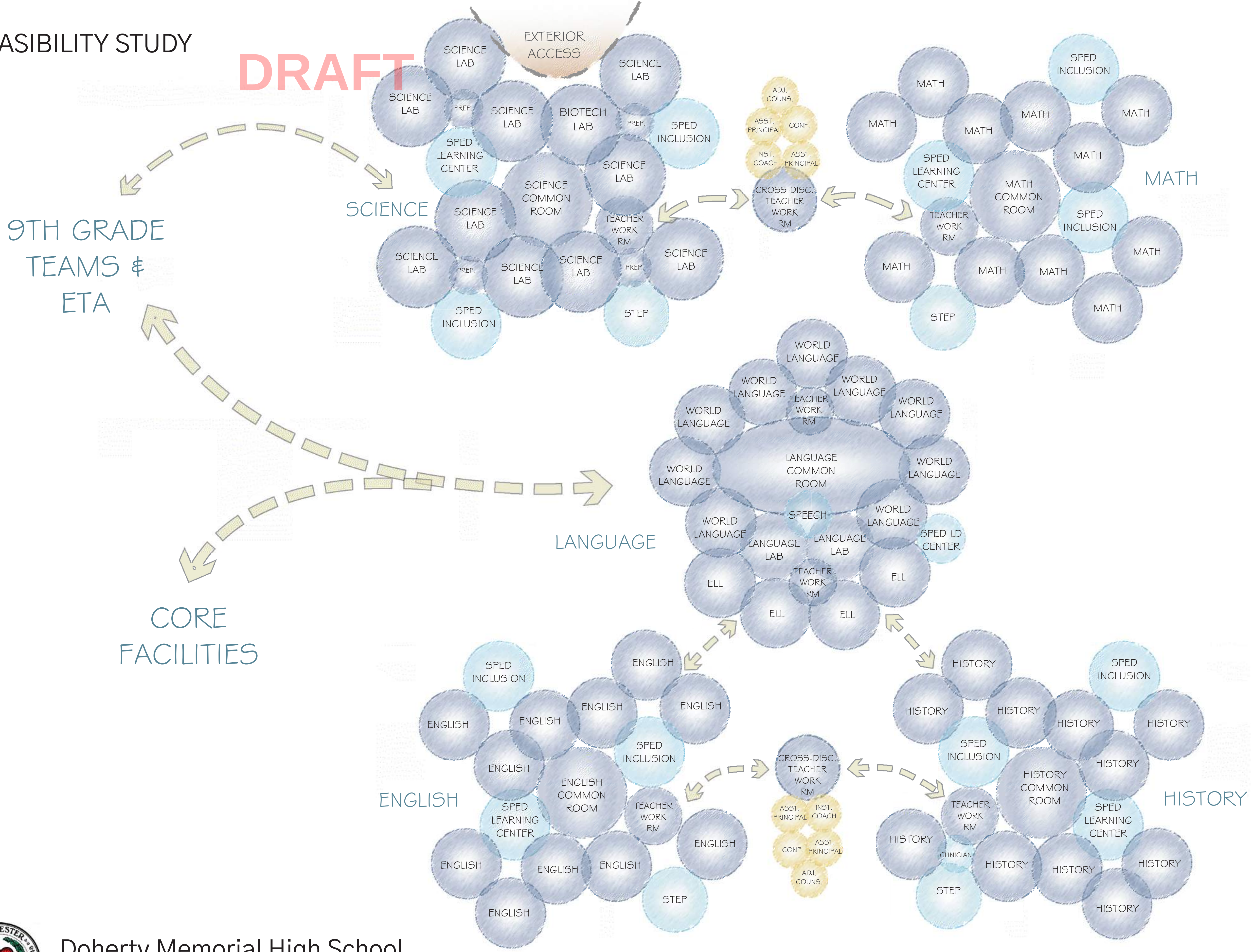
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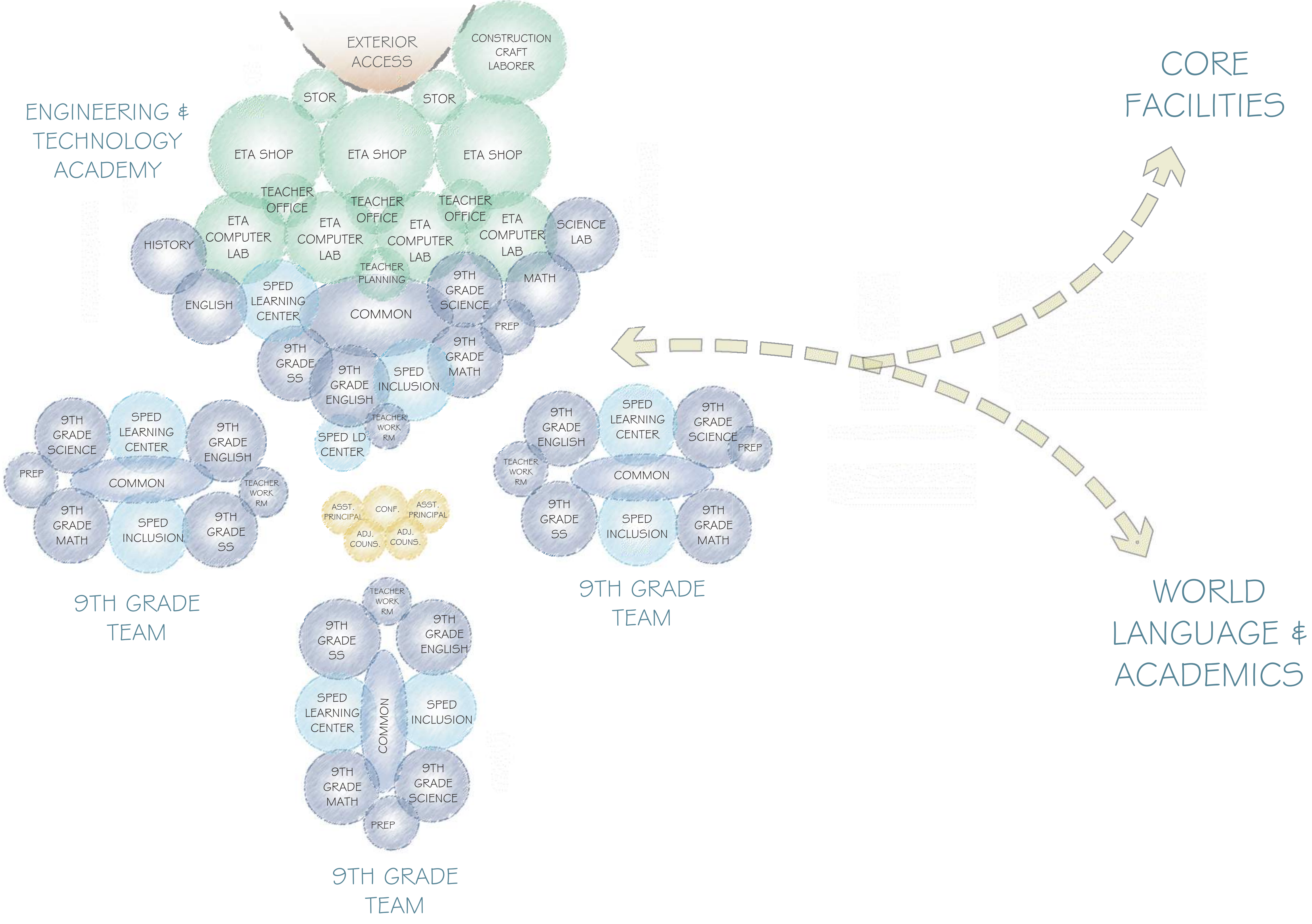
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9TH GRADE TEAM

3.3.4 PREFERRED SOLUTION

B. Updated Space Summary

1. Space Summary Template
2. Space Summary Template Variation Narrative
3. Updated Existing vs. Proposed Diagram

Proposed Space Summary - High Schools

Date: 1/2/2020 **Preferred Schematic Report**

DOHERTY MEMORIAL HIGH SCHOOL	Existing Conditions			PROPOSED Existing to Remain/Renovated			New			Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
CORE ACADEMIC SPACES			**49,686**			**0**			**101,640**			**0**			**80,000**	
(List classrooms of different sizes separately)																
Classroom - General	41	801	32,841				900	57	51,300				850	56	47,600	825 SF min - 950 SF max
Teacher Planning	5	295	1,475				400	12	4,800				100	56	5,600	
Department/Book Storage (included in gross)	141.2	5	706				~~200~~	~~9~~	0							
Small Group Seminar (20-30 seats) **(Common Rooms)**							900	9	8,100				500	4	2,000	3 x85% ut=20 Seats-1 per /day/student
									0							
Science Classroom / Lab	10	997	9,970				1,440	15	21,600				1,440	15	21,600	
Biotechnology Lab							1,440	1	1,440							
AVID Classroom	0	0	0				900	1	900							
Prep Room	2	378	756				200	16	3,200				200	15	3,000	
Central Chemical Storage Rm	2	369	738				200	1	200				200	1	200	
Small group room (EL)	2	873	1,746				900	4	3,600							
Language Lab	0	0	0				900	2	1,800							
Large Group Seminar Room	0	0	0				2,000	1	2,000							
Computer Science Classrooms	2	727	1,454				900	3	2,700							
SPECIAL EDUCATION			**5,340**			**0**			**32,950**			**0**			**14,620**	
(List classrooms of different sizes separately)																
SPED Planning	0	0	0				260	1	260							825-950 SF equal to surrounding classrooms
Self-Contained SPED **(Life Skills)**	1	449	449				950	2	1,900				950	12	11,400	
Therapeutic Planning	0	0	0				95	1	95							1/2 size Genl. Clrm.
Observation	0	0	0				85	1	85							1/2 size Genl. Clrm.
Adult Daily Living (ADL)	1	214	214				1,000	1	1,000							
Learning Disability Center			0				750	2	1,500							
SPED Adaptive PE (Sensory / Motor)	0	1	0				3,000	1	3,000							
STEP Classroom	2	834	1,668				900	4	3,600							
STEP Clinician	0	0	0				200	2	400							
									0							
Self-Contained SPED Toilet	1	39	39				100	3	300				60	12	720	
Resource Room **(Learning Center)**	6	441	2,646				900	8	7,200				500	5	2,500	
Small Group Room (Speech)			0				450	1	450							
OT/PT	1	324	324				900	1	900							
Inclusion SPED	0		0				900	12	10,800							
Vocational Learning Center	0	0	0				900	1	900							
SPED Office (Team Chair & Dept. Head)	0	0	0				150	2	300							
SPED Conference Room	0	0	0				260	1	260							
ART & MUSIC			**5,832**			**0**			**12,200**			**0**			**8,350**	
Art Classroom - **32 seats**	3	798	2,394				1,200	3	3,600				1,200	3	3,600	Assumed use - 25% Population - 5 times/week
Digital Arts Lab	0	0	0				1,200	1	1,200							
Art Workroom w/ Storage & kiln	1	180	180				175	4	700				150	3	450	
Band - 50 - 100 seats	1	1480	1,480				1,500	1	1,500				1,500	1	1,500	Assumed use - 25% Population - 5 times/week
Chorus - 50 - 100 seats	1	1009	1,009				1,500	1	1,500				1,500	1	1,500	
Piano Lab / Music Engineering Classroom	0	0	0				900	1	900							
General Music Classroom							900	1	900							
Ensemble	0	0	0				175	2	350				200	1	200	

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Rev. April 2019

Proposed Space Summary - High Schools

Date: 1/2/2020 Preferred Schematic Report

				PROPOSED												
DOHERTY MEMORIAL HIGH SCHOOL	Existing Conditions			Existing to Remain/Renovated			New			Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
Music Practice	4	49	196				75	6	450				75	8	600	
Music Storage	3	191	573				350	2	700				500	1	500	
Teacher Planning	0	0	0				400	1	400							
Common Room/ Gallery (included in gross)	0	0	0						0							
VOCATIONS & TECHNOLOGY			**6,562**			**0**			**28,800**			**0**			**17,280**	
Technology/Engineering Rooms													1,440	12	17,280	Assumed use - 100% Population - 5 times/week; 825 SF - 2,000 SF
Ch. 74 ETA Shop	2	926	1,852				2,500	3	7,500							
Teacher Planning	0	0	0				400	1	400							
Related Classroom / Computer Lab	4	872	3,488				900	4	3,600							
Teacher office	2	158	316				150	4	600							
ETA Storage	6	151	906				300	3	900							
Ch. 74 Programming & Web Development Computer Labs							900	4	3,600							
Help Desk							150	1	150							
Teacher office							150	2	300							
Storage							200	1	200							
									0							
Ch. 74 Marketing & Finance School Store (w/ Storage 300SF)							1,000	1	1,000							
Related Classroom							900	3	2,700							
Teacher office							150	2	300							
Storage							200	1	200							
Ch. 74 Construction Craft Laborer							5,000	1	5,000							
Related Classroom							900	2	1,800							
Teacher office							150	2	300							
Storage							250	1	250							
HEALTH & PHYSICAL EDUCATION			**19,674**			**0**			**37,852**			**0**			**25,552**	Excess PE Spaces Policy
Gymnasium	7,200	1	7,200				18,000	1	18,000				12,000	1	12,000	
Alt. PE **(Wellness / Project Adv.)**	1,486	1	1,486				3,000	1	3,000				3,000	1	3,000	
Fitness Room	220	1	220						0							
Fitness/ Exercise Room	269	1	269													
Weight Room w/ Storage and training room	842	3	2,526				2500	1	2,500							
Gym **/ Community** Storeroom	114	9	1,026				500	2	1,000				300	1	300	5.6 sf/student total
Locker Rooms - Boys / Girls w/ Toilets **(PE & Varsity)**	2,174	2	4,348				9,352	1	9,352				9,352	1	9,352	
Family Lockers/Toilets/Shower							250	1	250							
Outdoor Equipment Storage							300	1	300							
Phys. Ed. Storage	114	9	1,026				500	2	1,000				500	1	500	
Athletic Director's Office							150	1	150				150	1	150	
Health Instructor's Office w/ Shower & Toilet	364	2	728				250	2	500				250	1	250	
Health Classroom (Heath Ed Teachers)	1	845	845				900	2	1,800							
MEDIA CENTER			**4,262**			**0**			**11,200**			**0**			**10,338**	
Media Center / Reading Room / **Maker Space / Video Editing Studio**	1	2975	3,332				10,300	1	10,300				10,338	1	10,338	
Social Emotional Learning Center	310	3	930				900	1	900							
AUDITORIUM / DRAMA			**6,668**			**0**			**17,500**			**0**			**10,400**	Excess Auditorium Spaces Policy
Auditorium	1	4759	4,759				9,000	1	9,000				7,500	1	7,500	2/3 Enrollment @ 10 SF/Seat - 750 seats MAX
Stage	1	1909	1,909				2,500	1	2,500				1,600	1	1,600	

Proposed Space Summary - High Schools

Date: 1/2/2020 Preferred Schematic Report

DOHERTY MEMORIAL HIGH SCHOOL	Existing Conditions			PROPOSED Existing to Remain/Renovated			New			Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
Theater Classroom / Performance							900	1	900							
Black Box Theater							2,500	1	2,500							
Auditorium **/ Prop** Storage							500	1	500				500	1	500	
Costume Storage (included in gross)																
Make-up / Dressing Rooms / **Green Room**							400	2	800				300	2	600	
Controls / Lighting / Projection							400	1	400				200	1	200	
Performing Arts Maker Space							900	1	900							
DINING & FOOD SERVICE			**7,919**			**0**			**15,936**			**0**			**13,156**	
Cafeteria / Student Lounge / Break-out	1	4285	4,285				8,350	1	8,350				8,350	1	8,350	3 seatings - 15SF per seat
Chair / Table Storage	0	0	0				568	1	568				568	1	568	
Scramble Serving Area	1	551	551				3,000	1	3,000				600	1	600	
Kitchen	1	2586	2,586				3,150	1	3,150				2,970	1	2,970	1600 SF for first 300 + 1 SF/student Add'l
Staff Lunch Room	1	497	497				668	1	668				668	1	668	20 SF/Occupant
Satellite Grab & Go	0	0	0				200	1	200							
MEDICAL			**574**			**0**			**3,055**			**0**			**1,410**	
Medical Suite Toilet	1	30	30				60	4	240				60	1	60	
Nurses' Office / Waiting Room	1	125	125				400	1	400				250	1	250	
Interview Room	0	0	0						0				100	4	400	
Examination Room / Resting	3	85	255				100	5	500				100	7	700	
Resting Area (4 beds)	2	37	74				280	1	280							
Med Room							70	1	70							
~~Clean/~~Soiled/Jan.	0	0	0				220	1	220							
Clean Work	0	0	0				60	1	60							
Medical/wheelchair stor.	0	0	0				110	1	110							
Clinic Office	2	45	90				150	4	600							
Multipurpose	0	0	0				225	1	225							
Food Pantry/Clothing Distribution	0	0	0				350	1	350							
ADMINISTRATION & GUIDANCE			**6,877**			**0**			**10,059**			**0**			**6,041**	
General Office / Waiting Room / Toilet	1,115	1	1,115				835	1	835				835	1	835	
Teachers' Mail and Time Room	0	0	0				100	1	100				100	1	100	
Duplicating Room	0	0	0				200	1	200				200	1	200	
Records Room **(Vault)**	121	1	121				240	1	240				200	1	200	
Principal's Office w/ Conference Area	256	1	256				375	1	375				375	1	375	
Principal's Secretary / Waiting			0						0				125	1	125	
IO Clerk	255	1	255				0	0	0							
Assistant Principal's Office - AP1	160	6	960				175	6	1,050				150	1	150	
Assistant Principal's Office - AP2			0										150	2	300	
AP Secretary			0				150	3	450							
AP Conference Rm			0				200	3	600							
Supervisory / Spare Office **MCAS Coord**	187	1	187				175	1	175				120	1	120	
Conference Room	420	2	840				400	1	400				450	1	450	
Small Conference/Hearing			0													
Guidance Office	83	6	498				150	12	1,800				150	9	1,350	
Guidance Waiting Room	550	1	550				100	1	100				100	1	100	
Guidance Storeroom			0				150	1	150				100	1	100	
College & Career Center	896	1	896				900	1	900				568	1	568	
School Psychologist Office	120	1	120				150	1	150							
Records Room			0				234	1	234				234	1	234	
Guidance Conference Room	117	1	117				400	1	400							
Adjustment Counselor Office	133	4	532				175	4	700							
Teachers' Work Room			0										835	1	835	
School Resource Officer	0	0	0				150	1	150							
Security Office	0	0	0				150	1	150							
Job Placement Office (Tech Ed)		0	0				150	1	150							
Instructional Coach	430	1	430				175	2	350							
Instructional Coach/MCAS Conference Rm	0	0	0				400	1	400							

Rev. April 2019

DRAFT

Proposed Space Summary - High Schools

Date: 1/2/2020 **Preferred Schematic Report**

				PROPOSED												
DOHERTY MEMORIAL HIGH SCHOOL	Existing Conditions			Existing to Remain/Renovated			New			Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
CUSTODIAL & MAINTENANCE			**1,940**			**0**			**3,593**			**0**			**2,878**	
Custodian's Office	1	280	280				250	1	250				150	1	150	
Custodian's Workshop	0	0	0				250	1	250				250	1	250	
Custodian's Storage	3	182	546				375	1	375				375	1	375	
Recycling Room / Trash	1	128	128				400	1	400				400	1	400	
Receiving and General Supply	1	433	433				568	1	568				568	1	568	
Storeroom			0				1,000	1	1,000				935	1	935	
Network / Telecom Room			0				350	1	350				200	1	200	
Outdoor Equipment Storage	1	553	553				400	1	400							
OTHER			**0**			**0**			**4,500**			**0**			**0**	
Other (specify)									0							
Technical Services / IT							4,500	1	4,500							
									0							
Total Building Net Floor Area (NFA)			**115,334**			**0**			**279,285**			**0**			**190,024**	
Proposed Student Capacity / Enrollment									1,670	162.00					**1,670**	162
NON-PROGRAMMED SPACES					% of GFA	**0**		% of GFA	**140,716**		% of GFA	**0**				
Other Occupied Rooms (list separately)					#DIV/0!			0%			#DIV/0!					Non-Programmed space areas are
					#DIV/0!			0%			#DIV/0!					required to be included in the
					#DIV/0!			0%			#DIV/0!					following submittals:
					#DIV/0!			0%			#DIV/0!					Schematic Design Submittal
Unoccupied MEP/FP Spaces					#DIV/0!			0%			#DIV/0!					Design Development Submittal
Unoccupied Closets, Supply Rooms & Storage Rooms					#DIV/0!			0%			#DIV/0!					60% Construction Documents
Toilet Rooms					#DIV/0!			0%			#DIV/0!					90% Construction Documents
Circulation (corridors, stairs, ramps & elevators)					#DIV/0!			0%			#DIV/0!					Final Construction Documents
Remaining[3]					#DIV/0!	**0**		34%	**140,716**		#DIV/0!	**0**				
Total Building Gross Floor Area (GFA)[2]			168,000			0			**420,000**			0			**270,540**	
Grossing factor (GFA/NFA)			**1.46**			**#DIV/0!**			**1.50**			**#DIV/0!**			**1.42**	

[1] **Individual Room Net Floor Area (NFA)** Includes the net square footage measured from the inside face of the perimeter walls and includes all specific spaces assigned to a particular program area including such spaces as non-communal toilets and storage rooms.

[2] **Total Building Gross Floor Area (GFA)** footage measured from the outside face of exterior walls

[3] **Remaining** rea, it is assumed to equal the difference between the Total Building Gross Floor Area and area not accounted for above.

Architect Certification

I hereby certify that all of the information provided in this "Proposed Space Summary" is true, complete and accurate and, except as agreed to in writing by the Massachusetts School Building Authority, in accordance with the guidelines, rules, regulations and policies of the Massachusetts School Building Authority to the best of my knowledge and belief. A true statement, made under the penalties of perjury.

Name of Architect Firm: ______________________________

Name of Principal Architect: ______________________________

Signature of Principal Architect: ______________________________

Date: ______________________________

B. Updated Space Summary

2. Space Summary Template Variation Narrative

The following changes have been made to the Space Summary Template since the PDP submission. All changes have been highlighted in red font on the attached Space Summary Template.

Academic

- As requested in the MSBA PDP review comments, the Department/Book Storage line item has been removed from the space summary, and will be included in the grossing factor. (–1,800 NSF)

Special Education

- In an effort to maximize flexibility and equity, the Vocational Learning Center has been increased to 900 NSF to be consistent with the other full–sized classrooms and labs. (+50 NSF)

Art/Music

- No changes since the PDP submission

Vocations & Technology

- In an effort to maximize flexibility and equity, the Chapter 74 Related classrooms were increased to 900 NSF to be consistent with other full–sized classrooms and labs (+650 NSF)

Physical Education

- No changes from the PDP Submission

Media Center/Reading Room

- No changes since the PDP submission.

Auditorium

- No changes since the PDP submission.

Dining/Food Service

- No changes since the PDP submission

Medical

- No changes since the PDP submission.

Administration

- Per discussions with the school administrative staff, a dedicated Guidance Conference room was added to the space summary (+400 NSF)

Custodial and Maintenance

- No changes since the PDP submission.

Other

- No changes since the PDP submission.

Grossing Factor

The grossing factor is 1.5; no changes since the PDP submission

In summary, since the PDP submission the Total Building Gross Floor Area has not been changed since the PDP submission and remains at **420,000 GSF.**

ACADEMIC
EXISTING: 49,686 NSF
PROPOSED: 101,640 NSF

SPECIAL EDUCATION
EXISTING: 5,340 NSF
PROPOSED: 32,950 NSF

VOCATIONS & TECHNOLOGY
EXISTING: 6,562 NSF
PROPOSED: 28,800 NSF

HEALTH & PHYSICAL EDUCATION
EXISTING: 19,674 NSF
PROPOSED: 37,852 NSF

MEDIA CENTER
EXISTING: 4,262 NSF
PROPOSED: 11,200 NSF

ART/MUSIC
EXISTING: 5,832 NSF
PROPOSED: 12,200 NSF

AUDITORIUM
EXISTING: 6,668 NSF
PROPOSED: 17,500 NSF

DINING & FOOD SERVICE
EXISTING: 7,919 NSF
PROPOSED: 15,936 NSF

MEDICAL
EXISTING: 574 NSF
PROPOSED: 3,055 NSF

ADMIN & GUIDANCE
EXISTING: 6,877 NSF
PROPOSED: 10,059 NSF

CUSTODIAL & MAINTENANCE
EXISTING: 1,940 NSF
PROPOSED: 3,593 NSF

OTHER
EXISTING: 0 NSF
PROPOSED: 4,500 NSF

CIRCULATION, MECHANICAL, TOILETS, PARTITIONS, ETC.
EXISTING: 52,666 NSF
PROPOSED: 140,716 NSF

🟥	ADDITIONAL AREA REQUIRED BY EDUCATIONAL PROGRAM	
☐	TOTAL BUILDING AREA EXISTING	168,000 G.S.F.
☐🟥	TOTAL BUILDING AREA REQUIRED BY EDUCATIONAL PROGRAM	420,000 G.S.F.

3.3.4 PREFERRED SOLUTION

C. Sustainable Design

1. LEED–S V.4 Sustainability Scorecard
2. Designer Statement
3. Sustainability Narrative

LEED v4.1 BD+C: Schools

Project Checklist

Project Name: Doherty Memorial High School
Date: Dec-19

Y	?	N			
		1	Credit	Integrative Process	1

3	10	2	Location and Transportation		15
		N	Credit	LEED for Neighborhood Development Location	15
	1		Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
2	3		Credit	Surrounding Density and Diverse Uses	5
	4		Credit	Access to Quality Transit	4
	1		Credit	Bicycle Facilities	1
	1		Credit	Reduced Parking Footprint	1
1			Credit	Electric Vehicles	1

3	5	4	Sustainable Sites		12
Y			Prereq	Construction Activity Pollution Prevention	Required
Y			Prereq	Environmental Site Assessment	Required
1			Credit	Site Assessment	1
		2	Credit	Protect or Restore Habitat	2
		1	Credit	Open Space	1
	3		Credit	Rainwater Management	3
	2		Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1
		1	Credit	Site Master Plan	1
1			Credit	Joint Use of Facilities	1

7	0	5	Water Efficiency		12
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1		1	Credit	Outdoor Water Use Reduction	2
3		4	Credit	Indoor Water Use Reduction	7
2			Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

24	4	3	Energy and Atmosphere		31
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
5		1	Credit	Enhanced Commissioning	6
16			Credit	Optimize Energy Performance	16
	1		Credit	Advanced Energy Metering	1
		2	Credit	Grid Harmonization	2
3	2		Credit	Renewable Energy	5
	1		Credit	Enhanced Refrigerant Management	1

4	3	6	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		5	Credit	Building Life-Cycle Impact Reduction	5
1	1		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
	1	1	Credit	Building Product Disclosure and Optimization - Sourcing of Ra	2
1	1		Credit	Building Product Disclosure and Optimization - Material Ingre	2
2			Credit	Construction and Demolition Waste Management	2

6	2	7	Indoor Environmental Quality		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
Y			Prereq	Minimum Acoustic Performance	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
1	1	1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
	1	1	Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1			Credit	Interior Lighting	2
		3	Credit	Daylight	3
		1	Credit	Quality Views	1
		1	Credit	Acoustic Performance	1

6	0	0	Innovation		6
5			Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

2	2	0	Regional Priority		4
1			Credit	Regional Priority: EAc2 Optimize Energy Performance	1
	1		Credit	Regional Priority: EAc5 Renewable Energy Production	1
1			Credit	Regional Priority: Wec Cooling Tower and Process Water	1
	1		Credit	Regional Priority: Indoor Water Use Reduction	1

55	26	28	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

During the PDP phase, the understanding was that the City's recent Nelson Place Elementary School and South High Community goals of LEED silver certification would be the benchmark for sustainable design. After further review and discussion, the decision was made to achieve LEED "Certified" as a minimum level.

This is an acknowledgement that the Worcester Public Schools District has identified a minimum goal of "Certified" using LEED for Schools V.4.1 for this project, and will exceed the level of energy efficiency required in the current MA (base) energy code by 10%, using the LEED for Schools Energy and Atmosphere "Optimize Energy Performance" credit submittal to demonstrate that performance. As their Designer, I have submitted a completed LEED scorecard showing a minimum of forty (40) attempted points, which will meet that goal.

The scope of work for this project will include the construction elements and performance tasks to achieve that goal, and all subsequent documents, including but not limited to, specifications, drawings and cost estimates will match the scope of work indicated in the submitted scorecard.

Robert Para, Jr., AIA
Lamoureux Pagano Associates | Architects

3.3.4 PREFERRED SOLUTION

D. Building Floor Plans

To be added after vote

3.3.4 PREFERRED SOLUTION

E. Site Plan

1. Site Plan
2. Site Utility Plan

To be added after vote

3.3.4 PREFERRED SOLUTION

F. Budget Statement for Preferred Solution

1. Total Project Budget Overview
2. City of Worcester Capital Budget 2020
3. Budget Statement Chart

To be included with final PSR

See link below:

http://www.worcesterma.gov/uploads/19/26/192658c156cbc19cab328e1961b481ce/capital-budget-fY20.pdf

3.3.4 PREFERRED SOLUTION

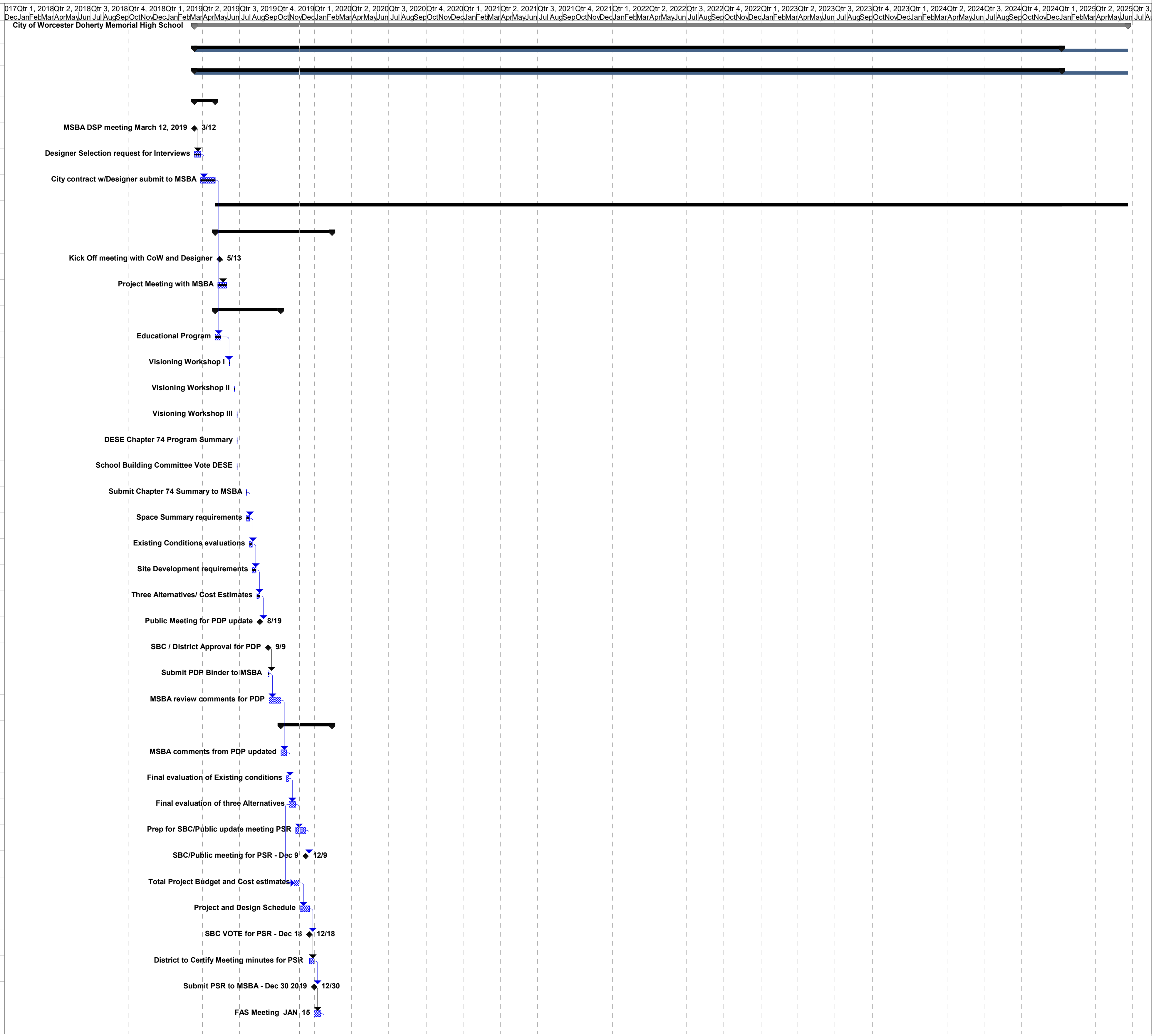
G. Updated Project Schedule

UPDATED: Mon 11/25/19

DRAFT

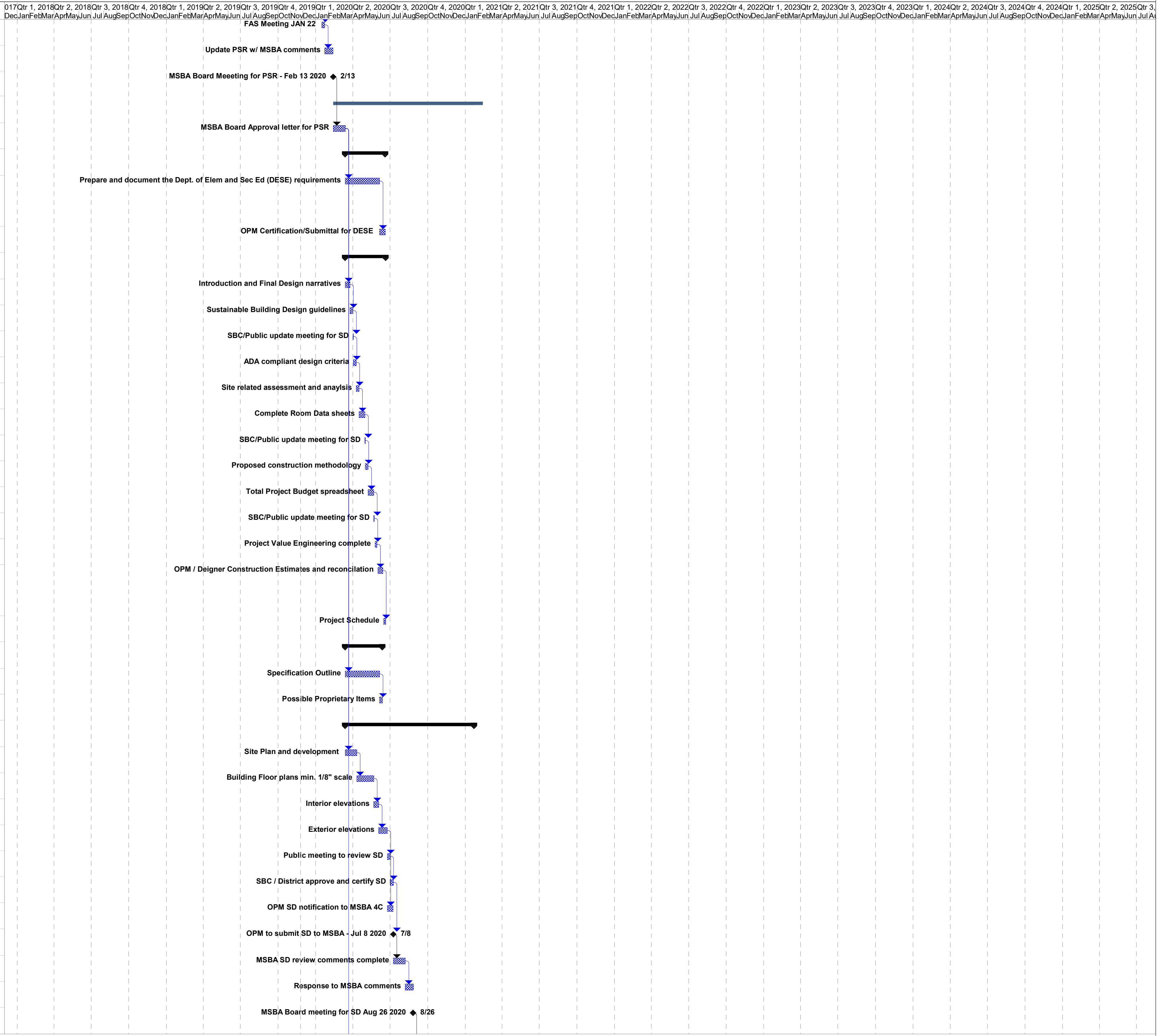
Doherty Memorial High School Feasibility/Schematic Design
Project Schedule

ID	Task Name	Duration	Start	Finish	Predeces	Resource Names
0	**City of Worcester Doherty Memorial High School**	**1637 days?**	**Tue 3/12/19**	**Wed 6/18/25**		
1	**DOHERTY MEMORIAL HIGH SCHOOL - PROJECT SCHEDULE**	**1521 days?**	**Tue 3/12/19**	**Tue 1/7/25**		
2	**MSBA Board Meeting**	**1521 days?**	**Tue 3/12/19**	**Tue 1/7/25**		
3	**MSBA DSP Meeting Schedule**	**37 days**	**Tue 3/12/19**	**Wed 5/1/19**		
4	MSBA DSP meeting March 12, 2019	0 days	Tue 3/12/19	Tue 3/12/19		
5	Designer Selection request for Interviews	11 days	Tue 3/12/19	Tue 3/26/19	4	
6	City contract w/Designer submit to MSBA	26 days	Wed 3/27/19	Wed 5/1/19	5	
7	**Feasibility Study thru Project Complete**	**1484 days?**	**Thu 5/2/19**	**Tue 1/7/25**		
8	**Feasibility Study - PDP**	**205 days**	**Thu 5/2/19**	**Thu 2/13/20**		
9	Kick Off meeting with CoW and Designer	0 days	Mon 5/13/19	Mon 5/13/19		
10	Project Meeting with MSBA	16 days	Wed 5/8/19	Wed 5/29/19	9	
11	Designer creates Preliminary Design Program	**115 days**	Thu 5/2/19	Wed 10/9/19		
12	Educational Program	10 days	Thu 5/2/19	Wed 5/15/19	6	
13	Visioning Workshop I	1 day	Wed 6/5/19	Wed 6/5/19	12	
14	Visioning Workshop II	1 day	Mon 6/17/19	Mon 6/17/19		
15	Visioning Workshop III	1 day	Mon 6/24/19	Mon 6/24/19		
16	DESE Chapter 74 Program Summary	1 day	Mon 6/24/19	Mon 6/24/19		
17	School Building Committee Vote DESE	1 day	Mon 6/24/19	Mon 6/24/19		
18	Submit Chapter 74 Summary to MSBA	1 day	Wed 7/17/19	Wed 7/17/19		
19	Space Summary requirements	5 days	Thu 7/18/19	Wed 7/24/19	18	
20	Existing Conditions evaluations	5 days	Thu 7/25/19	Wed 7/31/19	19	
21	Site Development requirements	7 days	Thu 8/1/19	Fri 8/9/19	20	
22	Three Alternatives/ Cost Estimates	6 days	Mon 8/12/19	Mon 8/19/19	21	
23	Public Meeting for PDP update	0 days	Mon 8/19/19	Mon 8/19/19	22	
24	SBC / District Approval for PDP	0 days	Mon 9/9/19	Mon 9/9/19		
25	**Submit PDP Binder to MSBA**	2 days	Mon 9/9/19	Tue 9/10/19	24	
26	MSBA review comments for PDP	21 days	Wed 9/11/19	Wed 10/9/19	25	
27	**Develop Preferred Schematic Report (PSR)**	**90 days**	Thu 10/10/19	Thu 2/13/20		
28	MSBA comments from PDP updated	10 days	Thu 10/10/19	Wed 10/23/19	26	
29	Final evaluation of Existing conditions	4 days	Thu 10/24/19	Tue 10/29/19	28	
30	Final evaluation of three Alternatives	12 days	Wed 10/30/19	Thu 11/14/19	29	
31	Prep for SBC/Public update meeting PSR	17 days	Fri 11/15/19	Mon 12/9/19	30	
32	**SBC/Public meeting for PSR - Dec 9**	0 days	Mon 12/9/19	Mon 12/9/19	31	
33	Total Project Budget and Cost estimates	10 days	Tue 11/12/19	Mon 11/25/19	30SS+9	
34	Project and Design Schedule	17 days	Tue 11/26/19	Wed 12/18/19	33	
35	**SBC VOTE for PSR - Dec 18**	0 days	Wed 12/18/19	Wed 12/18/19	34	
36	District to Certify Meeting minutes for PSR	8 days	Thu 12/19/19	Mon 12/30/19	35	
37	**Submit PSR to MSBA - Dec 30 2019**	**0 days**	**Mon 12/30/19**	**Mon 12/30/19**	36	
38	FAS Meeting JAN 15	12 days	Tue 12/31/19	Wed 1/15/20	37	



Doherty Memorial High School Feasibility/Schematic Design
Project Schedule

ID	Task Name	Duration	Start	Finish	Predeces	Resource Names
39	FAS Meeting JAN 22	5 days	Thu 1/16/20	Wed 1/22/20	38	
40	Update PSR w/ MSBA comments	14 days	Thu 1/23/20	Tue 2/11/20	39	
41	**MSBA Board Meeeting for PSR - Feb 13 2020**	**0 days**	**Thu 2/13/20**	**Thu 2/13/20**		
42	**SCHEMATIC DESIGN**	**261 days?**	**Thu 2/13/20**	**Thu 2/11/21**		
43	MSBA Board Approval letter for PSR	21 days	Thu 2/13/20	Thu 3/12/20	41	
44	**DESE Binder**	**70 days**	**Fri 3/13/20**	**Thu 6/18/20**		
45	Prepare and document the Dept. of Elem and Sec Ed (DESE) requirements	60 days	Fri 3/13/20	Thu 6/4/20	43	
46	OPM Certification/Submittal for DESE	10 days	Fri 6/5/20	Thu 6/18/20	45	
47	**Schematic Design Binder**	**71 days**	**Fri 3/13/20**	**Fri 6/19/20**		
48	Introduction and Final Design narratives	8 days	Fri 3/13/20	Tue 3/24/20	43	
49	Sustainable Building Design guidelines	5 days	Wed 3/25/20	Tue 3/31/20	48	
50	SBC/Public update meeting for SD	1 day	Wed 4/1/20	Wed 4/1/20	49	
51	ADA compliant design criteria	5 days	Thu 4/2/20	Wed 4/8/20	50	
52	Site related assessment and anaylsis	5 days	Thu 4/9/20	Wed 4/15/20	51	
53	Complete Room Data sheets	10 days	Thu 4/16/20	Wed 4/29/20	52	
54	SBC/Public update meeting for SD	1 day	Thu 4/30/20	Thu 4/30/20	53	
55	Proposed construction methodology	5 days	Fri 5/1/20	Thu 5/7/20	54	
56	Total Project Budget spreadsheet	10 days	Fri 5/8/20	Thu 5/21/20	55	
57	SBC/Public update meeting for SD	1 day	Fri 5/22/20	Fri 5/22/20	56	
58	Project Value Engineering complete	5 days	Mon 5/25/20	Fri 5/29/20	57	
59	OPM / Deigner Construction Estimates and reconcilation	10 days	Mon 6/1/20	Fri 6/12/20	58	
60	Project Schedule	5 days	Mon 6/15/20	Fri 6/19/20	59	
61	**Schematic Design Project Manual**	**65 days**	**Fri 3/13/20**	**Thu 6/11/20**		
62	Specification Outline	60 days	Fri 3/13/20	Thu 6/4/20	43	
63	Possible Proprietary Items	5 days	Fri 6/5/20	Thu 6/11/20	62	
64	**Schematic Deisgn Drawings 18"x24"**	**225 days**	**Fri 3/13/20**	**Thu 1/21/21**		
65	Site Plan and development	20 days	Fri 3/13/20	Thu 4/9/20	43	
66	Building Floor plans min. 1/8" scale	30 days	Fri 4/10/20	Thu 5/21/20	65	
67	Interior elevations	8 days	Fri 5/22/20	Tue 6/2/20	66	
68	Exterior elevations	15 days	Wed 6/3/20	Tue 6/23/20	67	
69	Public meeting to review SD	5 days	Wed 6/24/20	Tue 6/30/20	68	
70	SBC / District approve and certify SD	6 days	Wed 7/1/20	Wed 7/8/20	69	
71	OPM SD notification to MSBA 4C	10 days	Wed 6/24/20	Tue 7/7/20	68	
72	**OPM to submit SD to MSBA - Jul 8 2020**	0 days	Wed 7/8/20	Wed 7/8/20	70	
73	MSBA SD review comments complete	21 days	Thu 7/9/20	Thu 8/6/20	72	
74	Response to MSBA comments	14 days	Fri 8/7/20	Wed 8/26/20	73	
75	**MSBA Board meeting for SD Aug 26 2020**	0 days	Wed 8/26/20	Wed 8/26/20		



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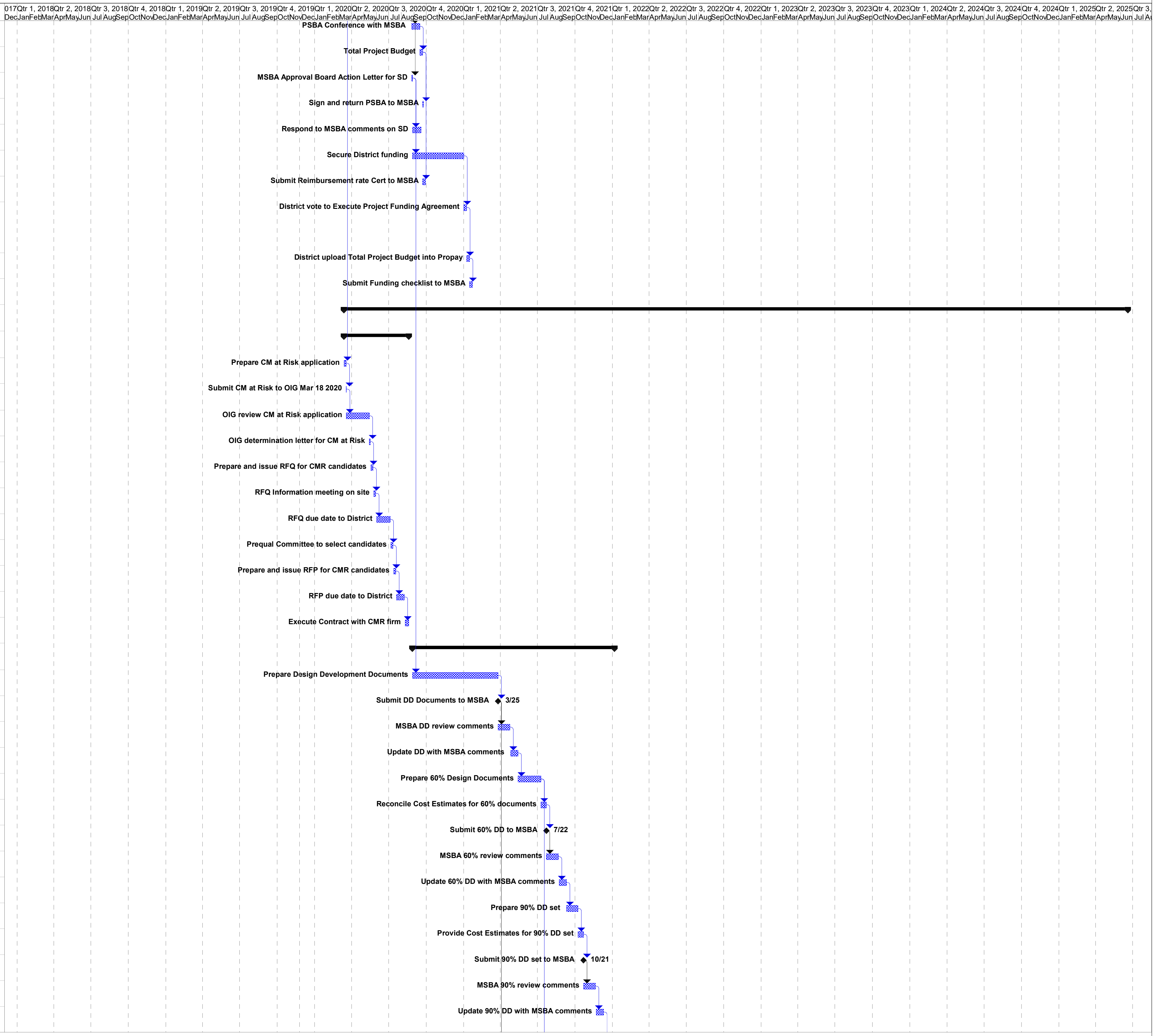
Doherty Memorial High School Feasibility/Schematic Design
Project Schedule

UPDATED: Mon 11/25/19

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
76	PSBA Conference with MSBA	14 days	Wed 8/26/20	Mon 9/14/20	75	
77	Total Project Budget	5 days	Tue 9/15/20	Mon 9/21/20	76	
78	MSBA Approval Board Action Letter for SD	2 days	Wed 8/26/20	Thu 8/27/20	75	
79	Sign and return PSBA to MSBA	2 days	Tue 9/22/20	Wed 9/23/20	77	
80	Respond to MSBA comments on SD	15 days	Fri 8/28/20	Thu 9/17/20	78	
81	Secure District funding	90 days	Fri 8/28/20	Thu 12/31/20	78	
82	Submit Reimbursement rate Cert to MSBA	5 days	Tue 9/22/20	Mon 9/28/20	77	
83	District vote to Execute Project Funding Agreement	5 days	Fri 1/1/21	Thu 1/7/21	81	
84	District upload Total Project Budget into Propay	5 days	Fri 1/8/21	Thu 1/14/21	83	
85	Submit Funding checklist to MSBA	5 days	Fri 1/15/21	Thu 1/21/21	84	
86	**BIDDING AND CONSTRUCTION**	**1374 days**	**Fri 3/13/20**	**Wed 6/18/25**		
87	**CM At Risk application process**	**113 days**	**Fri 3/13/20**	**Tue 8/18/20**		
88	Prepare CM at Risk application	3 days	Fri 3/13/20	Tue 3/17/20	43	
89	**Submit CM at Risk to OIG Mar 18 2020**	1 day	Wed 3/18/20	Wed 3/18/20	88	
90	OIG review CM at Risk application	40 days	Thu 3/19/20	Wed 5/13/20	89	
91	OIG determination letter for CM at Risk	2 days	Thu 5/14/20	Fri 5/15/20	90	
92	Prepare and issue RFQ for CMR candidates	5 days	Mon 5/18/20	Fri 5/22/20	91	
93	RFQ Information meeting on site	5 days	Mon 5/25/20	Fri 5/29/20	92	
94	RFQ due date to District	25 days	Mon 6/1/20	Fri 7/3/20	93	
95	Prequal Committee to select candidates	5 days	Mon 7/6/20	Fri 7/10/20	94	
96	Prepare and issue RFP for CMR candidates	5 days	Mon 7/13/20	Fri 7/17/20	95	
97	RFP due date to District	15 days	Mon 7/20/20	Fri 8/7/20	96	
98	Execute Contract with CMR firm	7 days	Mon 8/10/20	Tue 8/18/20	97	
99	**CONSTRUCTION DOCUMENTS**	**354 days**	**Fri 8/28/20**	**Wed 1/5/22**		
100	Prepare Design Development Documents	150 days	Fri 8/28/20	Thu 3/25/21	78	
101	Submit DD Documents to MSBA	0 days	Thu 3/25/21	Thu 3/25/21	100	
102	MSBA DD review comments	21 days	Fri 3/26/21	Fri 4/23/21	101	
103	Update DD with MSBA comments	14 days	Mon 4/26/21	Thu 5/13/21	102	
104	Prepare 60% Design Documents	40 days	Fri 5/14/21	Thu 7/8/21	103	
105	Reconcile Cost Estimates for 60% documents	10 days	Fri 7/9/21	Thu 7/22/21	104	
106	Submit 60% DD to MSBA	0 days	Thu 7/22/21	Thu 7/22/21	105	
107	MSBA 60% review comments	21 days	Fri 7/23/21	Fri 8/20/21	106	
108	Update 60% DD with MSBA comments	14 days	Mon 8/23/21	Thu 9/9/21	107	
109	Prepare 90% DD set	20 days	Fri 9/10/21	Thu 10/7/21	108	
110	Provide Cost Estimates for 90% DD set	10 days	Fri 10/8/21	Thu 10/21/21	109	
111	Submit 90% DD set to MSBA	0 days	Thu 10/21/21	Thu 10/21/21	110	
112	MSBA 90% review comments	21 days	Fri 10/22/21	Fri 11/19/21	111	
113	Update 90% DD with MSBA comments	14 days	Mon 11/22/21	Thu 12/9/21	112	



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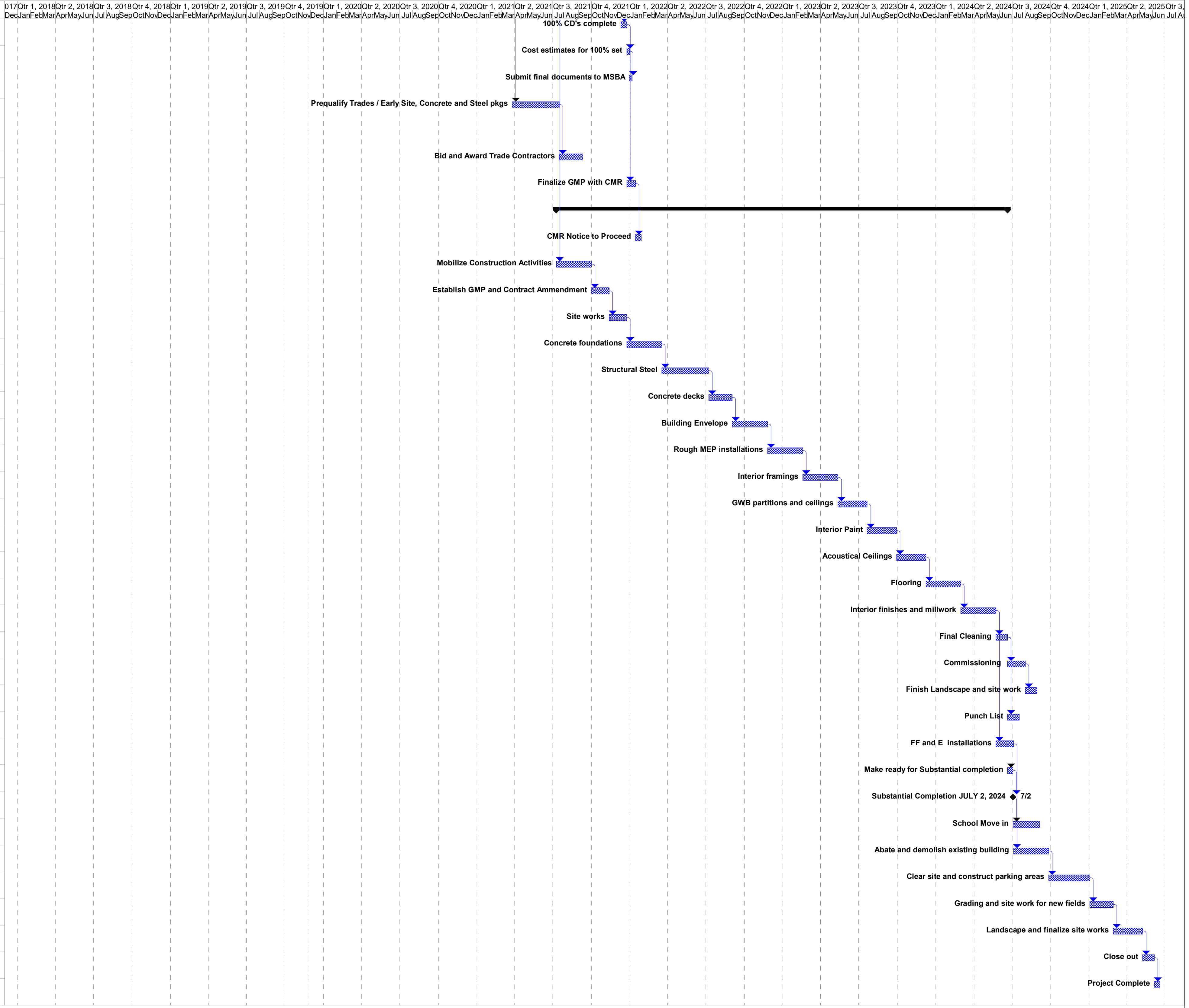
Doherty Memorial High School Feasibility/Schematic Design
Project Schedule

UPDATED: Mon 11/25/19

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
114	100% CD's complete	10 days	Fri 12/10/21	Thu 12/23/21	113	
115	Cost estimates for 100% set	5 days	Fri 12/24/21	Thu 12/30/21	114	
116	Submit final documents to MSBA	4 days	Fri 12/31/21	Wed 1/5/22	115	
117	Prequalify Trades / Early Site, Concrete and Steel pkgs	80 days	Fri 3/26/21	Thu 7/15/21	101	
118	Bid and Award Trade Contractors	40 days	Fri 7/16/21	Thu 9/9/21	117	
119	Finalize GMP with CMR	15 days	Fri 12/24/21	Thu 1/13/22	114	
120	**Construction**	**769 days**	**Fri 7/9/21**	**Wed 6/19/24**		
121	CMR Notice to Proceed	10 days	Fri 1/14/22	Thu 1/27/22	119	
122	Mobilize Construction Activities	60 days	Fri 7/9/21	Thu 9/30/21	104	
123	Establish GMP and Contract Ammendment	30 days	Fri 10/1/21	Thu 11/11/21	122	
124	Site works	30 days	Fri 11/12/21	Thu 12/23/21	123	
125	Concrete foundations	60 days	Fri 12/24/21	Thu 3/17/22	124	
126	Structural Steel	80 days	Fri 3/18/22	Thu 7/7/22	125	
127	Concrete decks	40 days	Fri 7/8/22	Thu 9/1/22	126	
128	Building Envelope	60 days	Fri 9/2/22	Thu 11/24/22	127	
129	Rough MEP installations	60 days	Fri 11/25/22	Thu 2/16/23	128	
130	Interior framings	60 days	Fri 2/17/23	Thu 5/11/23	129	
131	GWB partitions and ceilings	50 days	Fri 5/12/23	Thu 7/20/23	130	
132	Interior Paint	50 days	Fri 7/21/23	Thu 9/28/23	131	
133	Acoustical Ceilings	50 days	Fri 9/29/23	Thu 12/7/23	132	
134	Flooring	59 days	Fri 12/8/23	Wed 2/28/24	133	
135	Interior finishes and millwork	60 days	Thu 2/29/24	Wed 5/22/24	134	
136	Final Cleaning	20 days	Thu 5/23/24	Wed 6/19/24	135	
137	Commissioning	30 days	Thu 6/20/24	Wed 7/31/24	136	
138	Finish Landscape and site work	20 days	Thu 8/1/24	Wed 8/28/24	137	
139	Punch List	20 days	Thu 6/20/24	Wed 7/17/24	136	
140	FF and E installations	30 days	Thu 5/23/24	Wed 7/3/24	135	
141	Make ready for Substantial completion	9 days	Thu 6/20/24	Tue 7/2/24	120	
142	**Substantial Completion JULY 2, 2024**	0 days	Tue 7/2/24	Tue 7/2/24	141	
143	School Move in	45 days	Wed 7/3/24	Tue 9/3/24	142	
144	Abate and demolish existing building	60 days	Thu 7/4/24	Wed 9/25/24	140	
145	Clear site and construct parking areas	70 days	Thu 9/26/24	Wed 1/1/25	144	
146	Grading and site work for new fields	40 days	Thu 1/2/25	Wed 2/26/25	145	
147	Landscape and finalize site works	50 days	Thu 2/27/25	Wed 5/7/25	146	
148	Close out	20 days	Thu 5/8/25	Wed 6/4/25	147	
149	Project Complete	10 days	Thu 6/5/25	Wed 6/18/25	148	



3.3.4 PREFERRED SOLUTION

H. Supporting Documents

1. Program Refinement Minutes & Tours
    a. District SPED Inclusion Model
    b. Chapter 74 Programs
    c. Friends of Newton Hill Meeting Minutes
    d. Parks and Athletics Meeting Minutes
    e. Chapter 74 Tours
        1) Durfee Tour
        2) Medford HS Tour
        3) NEL CPS CCA Tour

Doherty-MSBA PDP Comment on Inclusion Model

8) The information provided indicates that the District is in the process of moving to a "more inclusive model" of instruction (p. 97). In response to these review comments, describe the steps the District has taken/is currently taking/will take to support this shift.

Does the district have a policy or statement (potentially from the coordinated program review) that we could use as a response to this question?

The mission of the Worcester Public Schools is to provide all students the opportunity to advance their scholarship with rigorous core curriculum and high quality instruction. This enables students to discover the expanse of their academic talents, shape the quality of their character, and develop the confidence to become conscientious, reflective citizens who are empowered to better our community and our world. This mission has been the forefront of Superintendent, Maureen Binienda, District Strategic Plan which outlines actions steps based on rigorous academic outcomes that promotes excellence for all students. The accountability for all WPS schools ensures student outcomes based on parent engagement given the collaboration of district and community stakeholders. The following key points of Superintendent Binienda's strategic plan for all schools will address the alignment of the critical components of Doherty Memorial High School (DHS) inclusive initiatives:

1. **Culture of Innovation** – Embrace a culture of innovation that develops and pilots evidenced-based approaches and allocates resources to address chronic student achievement gaps and underperforming schools

2. **Academic Excellence** – Increase opportunities for students to develop critical thinking and problem solving skills and demonstrate knowledge to increase career awareness and exploration at all grade levels through integrated coursework and a tiered My Career and Academic Plan (MyCAP) given a comprehensive mentoring program, and also access to digital learning options and courses

3. **Welcoming Schools** – Increase opportunities for family engagement and participation in decision making at the school level. School Accountability plans will also address district-wide expectations as well as prioritize the development of systems that support a shared vision for social emotional growth and school climate development across the district to include leadership training on DESE's Early Warning Indicator System (EWIS).

4. **Investing in Educators** – Provide pathways for educators to demonstrate mastery and advance in their professional development by using a recruitment and retention approach that will increase access to a highly qualified diverse teacher workforce.

5. **Technology & Operations** – Coordinate and align school administration, governance, and municipal processes to prioritize and support educational improvements for the success of all student.

Currently, WPS district initiatives embeds inclusion opportunities for students with disabilities based on key attributes of the Department of Elementary and Secondary Education Educator Effectiveness Guidebook for Inclusive Practices.

Inclusive practice refers to the instructional and behavioral strategies that improve academic and social-emotional outcomes for **all students,** with and without disabilities, in general education settings.

To support inclusive practice, Doherty High School will integrate tools of this *Guidebook* based on the frameworks of Universal Design for Learning, Positive Behavioral Interventions and Supports, and Social and Emotional Learning.

Summary of District professional development trainings that have promoted diversity and inclusive practices included: Central Office Administrators, Principals, Directors, School-based Instructional Leadership Teams, Coordinators, Dept. Heads, Coaches, General and Special Education Staff, and Para-educators. To date, various district representatives have engaged in various workshops which included national experts as well as a school based teams' given a cadre of comprehensive professional development activities which included resources and targeted interventions in the following areas:

- August 2019 Presentation by Michael Fullan - Book Study Nuances
- 2019 – 20 Presentation by Dr. J. Stuart Ablon – Author of The Discipline Fix (SEL- The Collaborative Problem Solving Approach)
- 2018 -19 Presentation and book study by Peter Dewitt – School Culture & Climate: Leading with Collective Efficacy
- 2017 -18 Elizabeth City - Instructional Rounds in Education
- DESE & Cast Initiatives - UDL Framework to address the diverse needs of students to ensure access
- MTSS Tiered Academic and SEL Interventions
- Content Subject Initiatives - Office of Professional Learning
- INSTIL and District Turnaround Practices - Walkthrough Protocol and Tool, Classroom Observations and What to Look For

The vision for the new Doherty High School inclusion initiatives have been aligned to the district strategic plan given a series of comprehensive professional development trainings which are designed to promote and embrace inclusion opportunities for students with disabilities.

The Special Education Department and the District Leadership Team has outlined the following objectives and strategies to promote inclusive practices with fidelity at Doherty High School:

1. Self-Assessment of DHS current practices of Inclusion services
    - DHS will analyze the results of their needs assessment, data and school accountability plan to ensure the fidelity of specialized instruction, and inclusion opportunities, professional learning based on rigorous outcomes for students with disabilities.
        - Coordinate professional development for co-teachers to develop skills, strategies and differentiation of instruction
        - Create a school based schedule that supports common planning time
        - Increased coaching within the classroom setting to support SWD
        - On-going PLC's and professional development on related topics to strengthen the skills set of general and special education inclusion teachers

2. DHS targeted objectives and strategies are also aligned to the District Strategic Plan and Turnaround Practice Initiatives:

    - Leadership, shared responsibility and professional collaboration
      Intentional practices for improving instruction
        - Expectations for rigorous and consistent standards-based instructional practices that will include well planned differentiation for targeted groups (EL's and SWD)
        - Promote systems of co-teaching to include common planning, PLC's, grade level meetings, focused instructional coaches, and department heads
        - PBIS and SEL Initiatives
        - Identification of teachers to promote co-teaching models and/or inclusive opportunities
        - Dual certifications for educators

    - Student – specific supports and instruction to all students
        - Analysis of assessments and common assessment data
        - Adapt curriculum tailored to the needs of individual students
        - Data to adapt and improve instructional strategies
        - Provide PLC's to support high quality evidenced based specialized instruction for SWD
        - Assure individual students' IEP goals and objectives, and accommodations are implemented with fidelity

    - School Culture and Climate - Instructional Leadership and School based Teams
        - Efficacy and Equity of all learners
        - Diversity of Learners
        - Positive Behavioral Intervention and Supports
        - EL's and WIDA standards and the intersection of SWD
        - Targeted instructional practices that promote inclusion opportunities

3. Analysis of State and District Data (MCAS, STAR, AP, Common and Benchmark Assessments)

4. Collaborative Data Meetings (Grade Levels, and across content subjects)
    - Accountability measures using data decision making to improve outcomes for SWD by increasing inclusion placements and reducing substantially separate placements (DHS - Quarterly analysis of placement data points)
    - Data informed decision making when measuring and discussing a student’s readiness or ability to be successful in an inclusion setting
    - Progress Monitoring Tools
    - Address Least Restrictive Environment by monitoring placement options
    - Accountability of retention and academic failure to address dropout prevention
    - Transition Planning to promote College to Career to expand post-secondary outcomes
    - Increase specialized instruction skills to include self-advocacy, literacy and executive functioning

5. Multi-disciplinary Meetings (Professional Learning Communities, Instructional Support Teams by Departments and Grade Levels) to effectively increase inclusion opportunities

6. Fiscal impact of goal setting to address scheduling, staffing needs and assignments of staff
    - Budget allocation process to identify staffing needs and classroom student / teacher ratios
    - Scheduling to ensure co-teaching and additional supports
    - Alignment and Allocation of funding to support evidence based curriculum and technology tools to address diverse learners

7. Professional development Training on topics such as; Diverse Learners, Specialized Instruction, UDL, Technology Tools etc.,
    - DESE Educator Effectiveness Guidebook for Inclusive Practices.
    - What to Look For: Classroom Observations, Lesson Plans and Instructional Rounds
    - Student Vision and Feedback
    - Specialized classrooms rubrics for entrance and exit criteria
    - Implementation of GoalBook – IEP Tools to align academic goals and objectives to CORE standards, additional tools include behavioral and social emotional interventions

8. To promote students with disabilities (SWD) to be college and career ready, Doherty High School guidance will monitor WPS Criteria for High School Grade level Assignments to ensure that SWD are on track for graduation

- Mindset shift to promote the beliefs that all students must have access to inclusion
- Increased use of technology to support student needs and promote independence in the LRE
- Increased social opportunities in the school community for SWD: speaks to a school culture that accepts SWD that promotes inclusion opportunities
- Promote family involvement and engagement in the school community

Throughout the coming years, DHS will engage in extensive professional development from the special education department, central administration team and consultants. Collectively, district leaders will engage Doherty High School staff, families and community stakeholders to work collaboratively to promote a safe school where all students have the essential skills to prepare them for college and career opportunities.

DHS Inclusion implementation plan will be developed based on a series of inquiry questions, data analysis and resources from the "Educator Effectiveness Guidebook for Inclusive Practices" as outlined given the following action steps from (Pages 167-180)

Part 1: DHS Reflective Questions:

- To what degree are we using our schedule to promote develop and sustain an inclusive learning culture?
- Does the master schedule support collaboration between special educators, English Learners, specialist and general educators?
- What trends, strengths and deficits are present in school-based data?
- If instructional data reflects a need for improved Tier 1 instruction in specific areas, does the master schedule address those needs by supporting targeted instruction?
- Where does school-wide data reflect the need for more intensive tiered intervention?
- Classroom analysis - What is the ideal balance of needs in a general education classroom reflecting level of needs informed by IEPs (i.e., low, moderate, high)?
- What resources, professional development and ongoing support will be needed by educators in general education classrooms with a high portion of student needs?
- Is there an expectation and/or have staff been trained and supported in how to navigate the collaborative partnerships of (co-teaching) such that clear roles and responsibilities are determined?

Part 2: Developing a DHS Inclusive School Schedule Team Protocol - This tool will be used to review master schedules for alignment with best practices for inclusion

- Purpose: Use the tool to leverage DHS master schedule to create, develop and sustain an inclusive learning culture
- Identify Goals (Instructional Leadership Team)

- Develop Outcomes (priorities and considerations to support inclusive practice)

Part 3: Inclusive Practice Tool: DHS Staff Feedback Discussion Protocol

- DHS classroom educators will use this tool to reflect on inclusive practice of their leadership
- DHS building administrators will use this tool to self-assess their own inclusive practice
- WPS District administrators will use this tool to support inclusive practice across schools

Part 4: DHS Effective Inclusive School Communities . . . PD Planning Guide

DHS Leadership Team	DHS Staff will be	DHS School Environment will
Support teaching approaches that address the needs of diverse learners	Presenting curriculum content through multiple means and providing scaffolds and support for metacognitive processing	Be safe and respectful of all cultures and backgrounds
Creating and maintaining a master schedule that prioritizes inclusive placement of students when appropriate	Providing clear academic objectives and behavioral expectations	Support a variety of tasks and learning formats
Establishing and maintaining tiered systems of positive behavior supports	Providing options for student engagement, persistence and self-regulation	Be conducive to collaboration and group work
Engaging with stakeholders at all levels to promote and encourage a shared vision of inclusivity and differentiated supports	Use data and student response to differentiate instruction and support	Use clear and effective displays of interventions (i.e., assistive technology, resources, accommodations and prompts)
Interacting with individual students, demonstrating awareness of diverse backgrounds and academic profiles	Providing multiple options and supports to facilitate a language rich environment	Be rich with connections to student experience and interest and clearly display expectations, rules and routines
Communicating with parents and families regularly effectively, and with cultural sensitivity	Demonstrating a shared accountability for all students	Demonstrate a school-wide commitment to providing a positive social emotional culture
Providing positive reinforcement and motivators	Providing positive reinforcement and motivators	Be strategic to meet the needs of all learners

Part 5: Positive Behavioral Interventions and Supports (PBIS) - A Framework for organizing the implementation of evidenced based practices across a multi-tiered support system. PBIS focuses on making improvements in the school or classroom environment to ensure students will successfully meet social, behavioral and academic standards. DHS instructional leadership team, child study staff and special education clinicians will review current behavioral intervention supports and utilize a multidisciplinary team to meet the social emotional learning (SEL) needs of all students. Identifiable needs would be addressed to meet the needs of students with disabilities in inclusive classrooms. For example: A function-based approach would be used to develop and implement individual behavioral intervention plans, and a wraparound approach is taken to integrate family community and school support.

Annually, WPS accountability plans outlines that each school must integrate services and programs with the aim of upgrading the entire educational program of the whole school and to help all students reach proficient and advanced levels of achievement. The integration of inclusive services at Doherty High School will include the following areas of focus:

- Equity of Access: Ensuring all students have access to high quality instruction and materials and resources
- Engagement: Engagement with families and the various sectors of our community in developing opportunities for all students
- Safe and Healthy Students: Create supportive safe, and orderly learning environments marked by respectful interactions, acceptance, inclusiveness, and responsibilities to one another
- High quality teaching and learning: To support excellent instruction that improves students skills to prepare them for global citizenships
- College and Career Readiness: In support of current standards, activities that help students become college and career ready

DHS Instructional Leadership Team's (ILT) primary role will help lead the school's efforts at supporting the improvement of teaching and learning. The Principal and the ILT will also make decisions about the school's instructional program, leads and monitors student performance data regarding progress toward goals, coordinate several internal audits and self-assessments which will also include the inclusion self-assessment. The ILT will meet regularly twice monthly.

DHS (2019-20) Accountability Plan will include the following:

- Comprehensive Needs Analysis
    - Accountability Indicators [Achievement, Growth, Discipline, Chronic Absenteeism and Attendance, Graduation and Dropout Rate, Progress toward attaining English Language Proficiency and Students with Disabilities
- Action Plan
    - Leadership, Shared Responsibility, and Professional Collaboration

  - Establishing a community of practice through leadership shared responsibility for all students, and professional collaboration (Focus on improving core instruction and tiered interventions systems using a variety of data)
  - Include targeted support to strengthen PLC practices and ensure access for all students
  - Intentional Practices for Improving Instruction [Employing intentional practices for improving teacher –specific and student responsive instruction]
  - Focus on refining the use of observations and student-specific data so that constructive feedback to teachers is provided and student specific needs are clearly identified to inform instructional responses
  - Providing Student- Specific Targeted Supports and Instruction to Ensure Access for All Students
  - A Safe, Respectful, and Collegial Climate for Teachers, Students and Families
  - Reducing Chronic Absenteeism
  - High School Graduation Rate and Persistence [The Graduation Rate Improvement Team will monitor student attendance and achievement, review progress of participants in the “Adopt-A-Student” program, review feedback forms, and work with faculty to support efforts to increase student achievement

- Identify what evidence (artifacts, data sources, observations, etc.,) will DHS school instructional team gather to monitor growth and/or change?
  - Evidence will include the following data source:

Adult Implementation Indicator	**Student Results Indicator**
Department meeting agendas	MCAS Data
PLC	STAR Data
Faculty meeting agendas	ACCESS Data
Shared student work samples	PSAT/SAT Data
Classroom visits	Advanced Placement Data
Observations	Common Assessments
Lesson Plans	Student Portfolios
Exit slips from professional learning activities	

- Alignment of the District Strategic Plan and Doherty High School Professional Learning Plan (PLP) will also provide the necessary assurance to promote inclusive services:
  - Support critical reading and writing across content areas to engage all learners

- Support culturally and linguistically diverse students
- Support social emotional needs of all students
- Support co-teaching opportunities for SWD

Meeting Minutes | PSR & Ch. 74 Programs

10.01.2019

Attendees:

- Maureen Binienda | Superintendent | Worcester Public Schools
- Jim Bedard | Director of Environmental Management & Capital Projects | WPS
- Russ Adams | Assistant Commissioner | Worcester DPW
- John Staley | Assistant Principal | Doherty Memorial High School
- Kyle Brenner | Principal | Worcester Technical High School
- Eugene Caruso | OPM | Tishman AECOM
- Katie Crockett | Principal in Charge | LPA|A
- Rob Para Jr. | Project Architect | LPA|A
- Chris Lee | Project Manager | LPA|A
- Christina Bazelmans | Assistant Project Architect | LPA|A

Item:	Description:	Responsibility:
PDP EDUCATIONAL PROGRAM		
10.01.2019.01	Confirmed Adjustment counselor offices should be distributed with Assistant Principal suites throughout academic areas.	**Info.**
10.01.2019.02	Instructional coaches should be distributed in the academic area. John Staley (JS) confirmed that they do not require a dedicated conference room if there is adequate space in office for a small meeting and another conference room is located nearby.	**LPA|A**
10.01.2019.03	Guidance • Confirmed (12) Guidance offices, which should be centralized and in proximity to the Main admin suite. • JS will review the with Principal Sally Maloney (SM) if a 20-seat guidance conference room is required in addition to the Career Center/Café	WPS
10.01.2019.04	Dining & Food Service • Cafeteria area is based on 1670 enrollment at 3 lunches. Potential increase of enrollment may necessitate 4 lunch periods. • Confirmed that a buffet is desired in the Staff dining area, for daily staff use and after-hours events.	Info.

Item:	Description:	Responsibility:
10.01.2019.05	JS Confirmed the following teacher planning spaces are adequate for cross discipline collaboration: • (6) Core academic: Math, English, History, Science, WL, ELL • (4) 9th grade Teams • (2) for cross disc. (Math/Science and English/History) • (1) Music/Art • (1) SPED • (1) ETA Teacher planning (confirm if this is a duplicate)	Info.
10.01.2019.06	Special Education • SM and Kay Seale to review the number and size of inclusion classrooms in the Space summary with proposed staff and Educational Program. o (2) per academic department and one per 9th grade team.	WPS
10.01.2019.07	Vocational/Tech Ed • JS and Kyle Brenner (KB) will meet to review the proposed schedule and number of teachers and spaces required to achieve the minimum 900 hours of program related instruction. Schedule review will confirm if related classrooms may be shared or reduced. • LPA|A and WPS will set up tours of similar Chapter 74 programs and a revisit to Billerica Memorial HS. o October 9th ▪ 10:00 AM BMC Durfee HS, Fall River o October 18th ▪ TBD: Minuteman Regional Technical, Lexington MA ▪ TBD: Medford Vocational Technical HS, Medford MA ▪ TBD: Montachusett Regional Vocational School, Fitchburg MA o TBD ▪ TBD: NEL CPS Construction Career Academy Cranston RI	LPA|A / WPS

Item: **Description:** **Responsibility:**

10.01.2019.08 DESE Ch 74. Approval Process

- KB will inquire with Ramona Foster at DESE as to the review status of the Doherty Ch. 74 Program Submission, submitted to the MSBA on 7/19/19.
- Eugene Caruso (EC) will follow up with MSBA regarding the PDP review status

WPS

- DESE's annual Chapter 74 program approval process is sequential, for 2019–2020:

OPM

Intent to Apply (required prior to Part A submission)	5:00 pm, 9/23/2019
Preliminary (Part A)	5:00 pm, 11/22/2019
Concluding (Part B)	5:00 pm, 3/13/2020
Final Decisions (except where facility and/or licensure does not permit)	6/30/2020
Final Decisions (All other)	11/1/2020

Info

- DESE suggests that each program should be established as a CTE program prior to application.

10.01.2019.09 Coping room in Ed. Program is synonymous with Social Emotional Learning Center (in-house suspension). Therapeutic planning, STEP cooldown space and extra exam room in nurse's suite are separate. Info.

10.01.2019.10 JS noted that all proposed computer labs are fully scheduled and staffed, and sharing between different departments is not likely. Info.

10.01.2019.11 JS confirmed that two health classrooms are required to support two health teachers (increased from 1.4 due to larger enrollment) Info.

Minutes by: Christina Bazelmans, LPA|A

Distribute to: Attendees, Steering Committee

File location: 1904/Minutes/Owner/2019.10.01 PDP SST

Meeting Minutes | Friends of Newton Hill 10.30.2019

Attendees:

- Refer to Sign in Sheet

Item:	Description:	Responsibility:
	The following is only a synopsis of discussions:	
10.30.2019.01	LPAA reviewed the process and that LPAA is reviewing the Doherty site (various options), the Chandler Magnet site, and the Foley Stadium site.	**Info.**
10.30.2019.02	LPAA reviewed that we are reviewing options for the Doherty site, with the existing school remaining occupied. Have a list of topics and begin discussion on.	**Info.**
10.30.2019.03	FNH discussed that in their opinion, the land taking in 1960 was not correctly done and not valid.	Info.
10.30.2019.04	FNH discussed that the land developed for the school is what they consider being school land, the areas that were not developed when the school was built remain part of the park.	Info.
10.30.2019.05	FNH discussed that the City should find location for the students to move and to free up the entire parcel for development, and avoid having the massive building at the east end where the fields are.	Info.
10.30.2019.06	FHN discussed that the proposed location would be a degradation to the park.	Info.
10.30.2019.07	FHN discussed the Beech trees along Highland Street and the existing stone wall.	Info.
10.30.2019.08	FHN discussed that extensive retaining walls would not be desired.	Info.

Item:	Description:	Responsibility:
10.30.2019.09	LPAA discussed potential of adding a path from the rear of the school to the existing path to Pleasant Street. Clarified that the intent of the path would be similar to the existing.	
	FNH questioned this, and if it would fall under Article 97.	Info.
	LPAA responded, this is a suggestion, if beneficial to all parties, and if done, would be done as part of park improvements so Article 97 would not be applicable.	
10.30.2019.10	LPAA discussed if this or other improvements would be jointly beneficial and FNH to come up with a list – noted:	
	a. XCountry/trail improvements b. Health walk/improvements at north side of Pleasant Street c.	Info.
10.30.2019.11	LPAA noted that the east/west trail is mostly on the parks property except at the south end (recently published survey).	
	FNH, Rick Miller, noted with his observations note, the corners were staked out and appears different.	
	Post Note: There is a traverse stake by the surveyor that is <u>not</u> the property line, which gives the appearance that the actual line is as RM describes. However, the trail is mostly on the park land (enclosed for reference is the survey/top).	

Attachments:	As Noted
Minutes by:	Robert Para/pf., LPA|A
Distribute to:	Friend of Newton Hill Parks Dept. DPW School Department OPM
File location:	1904/Minutes/Owner/2019.10.30 Friends of Newton Hill

Meeting Minutes | Parks & Athletics

10.03.2019

Attendees:

- **Maureen Binienda** | Superintendent | Worcester Public Schools
- **David Shea** | Athletics Director | WPS
- **Jim Bedard** | Director of Environmental Management & Capital Projects | WPS
- **Rob Antonelli** | Assistant Commissioner DPW&P | City of Worcester
- **Russ Adams** | Assistant Commissioner | Worcester DPW
- **Katie Crockett** | Principal in Charge | LPA|A
- **Rob Para Jr.** | Project Architect | LPA|A
- **Rick Lamoureux** | Principal & Project Manager | LPA|A
- **Chris Lee** | Project Manager | LPA|A
- **Christina Bazelmans** | Assistant Project Architect | LPA|A

Item:	Description:	Responsibility:
PDP EDUCATIONAL PROGRAM		
10.03.2019.01	LPA|A Reviewed the scope of the study and the three sites currently under investigation (Doherty Site, Foley Stadium site and Chandler Magnet School Site)	**Info.**
10.03.2019.02	Confirmation of which fields/courts are the highest priority is contingent on a selected site and the proximity to existing fields, with the understanding that none of the proposed sites can meet the full desired site program. (Review with Doherty Athletic program/ department head)	**Info.**
10.03.2019.03	David Shea (DS) confirmed that students walk from Doherty to Foley stadium via Pleasant street (rarely along Park Ave) and that there is a back entrance to the stadium complex at Coombs road. • Noted that the google aerial image should be updated to reflect that the tennis courts have been removed	Info.
10.03.2019.04	DS reviewed the use of Foley Stadium and practice fields. See attached file **Foley Stadium Usage & Schedule 10.03.19.pdf** • Foley Stadium is also rented for community use, but school use takes priority. • This document takes into account the teams that will utilize the new game and practice field at the new South High.	Info.

Item:	Description:	Responsibility:
	• Many indoor track students will be displaced once the existing South High building is demolished, it would be very problematic to lose the outdoor track at Foley Stadium as well. • If the Foley Stadium site is selected, the loss of Stadium could displace up to 1500-1700 student athletes, therefore a replacement facility would need to be completed prior to the start of construction	
10.03.2019.05	Program for a replacement stadium would include: • Football stadium with track and bleachers for 1500 • Adjacent flat space for additional visitors / BYO seating • Lockers and toilet facilities (code requirement) • Storage and service building • Parking, bus drop off and access facilities • Baseball field and two rectangular fields, practice fields as currently developed, as a minimum. • Noted that at present, other area fields have to be used for Doherty and other WPS field use. • LPA will develop a budget for the cost of replacing this facility for the purposes of the Feasibility Study	LPA|A
10.03.2019.06	Rob Antonelli (RA) reviewed the use of the nearby parks. See attached file Parks Maps & Usage 10.03.19.pdf	Info.

10.03.2019.07	Newton Hill
	• Doherty's cross-country running and cross-country skiing teams use Newton Hill to practice
	• Upper parking area is used by parks for access to disc golf and top of Newton Hill.
	  o Rob Para (RP) noted that the existing parking lot was constructed slightly over the property line into park land. Have no records what agreement that was in place at the time for joint use.
	  o RA noted that the Parks Dept. needs access to Newton Hill for maintenance somewhere in the
		Info.

-
  - vicinity of the student parking lot and that repaving these parking spaces would be acceptable if access to the park is maintained at this location.
  - The School noted they will review the security implications of this arrangement.
- RA noted they would be amendable to the creation/improvement of a path to Foley stadium or signage, trail improvements if considered mutually beneficial.
- Accessibility of this path may be an issue; a MAAB variance may be required
- DS suggested that resurfacing the Newton Hill tennis courts could be a part of the Doherty project, similar to South High precedent.

10.03.2019.08 Beaver Brook

- Fields are designed so that the open field area, and low areas between the fields floods first during the routine flooding. Though at larger storms/rain events. The game fields still experience a minor flood a few times per year and a major flood every 5 years.

CoW

- Football field and softball field are regulation size, two little league fields are smaller, but there is no room for expansion. RA will provide site plans and a narrative of the current use.
- Students park at Beaver Brook lot for access to Foley stadium
- All fields are scheduled fully from 5:00 PM onward; Parks department gives scheduling priority to the schools, permit must be requested. WSU and Assumption also reserve field use, as their own facilities are limited
- RA noted that moving some of the programs scheduled at Beaver Brook would not be possible due to lack of transportation for area residents who primarily use these fields.

CoW

- Test borings completed for lighting improvements are available, the lights did require deeper caissons due to the soil conditions. RA will forward the information they have

Item: Description: Responsibility:

available. RA questions if soils are adequate to support a track without differential settlement.

10.03.2019.09 Duffy Park

- Though the park has a brand new playground, RA noted that the baseball field is underutilized. The field has no lighting, and nearby wetlands.
- Redevelopment of the baseball fields to much needed rectangular fields may increase utilization. The parks department has reviewed clearing additional trees to expand the field area.
- Coordination with and sensitivity to neighbors would be required.
- Improvements to Duffy Field could take place prior to construction at Doherty to supplement the loss of practice fields on site.
- The Road extension (paper street) land would be available for use as being City owned.
- The owners of the adjacent land where the tower are not familiar to the team.

Info.

10.03.2019.10 Chandler Magnet

- The fields behind Chandler Magnet School are maintained and scheduled by WPS, and is assumed not subject to Article 97. (**See attached file Chandler Magnet Field Usage 2018.pdf**)
- Adult Men's leagues and Burkett little league rent this field outside of school hours.
- Noted that the northerly and easterly property line is 30-70 feet beyond the current developed area and fields.
- Noted that the westerly foot of the slope is 50-70 feet beyond the developed area.

Info.

Minutes by: Christina Bazelmans, LPA|A

Distribute to: Attendees, Steering Committee

Attachments: Foley Stadium Usage & Schedule 10.03.19.pdf , **Chandler Magnet Field Usage 2018.pdf**
Parks Maps & Usage 10.03.19.pdf

File location: 1904/Minutes/Owner/2019.10.03 Athletics and Parks

Commerce Bank Field
at
Foley Stadium

1. Worcester Public Schools teams that utilize Foley Stadium:
   - A. Burncoat Varsity Football
   - B. Doherty Varsity Football
   - C. North Varsity Football
   - D. South Varsity Football
   - E. Worcester Tech Varsity Football
   - F. North JV Football
   - G. Doherty JV Football
   - H. Doherty Freshman Football
   - I. JV Thanksgiving "Turkey Bowl" Games
   - J. Varsity Thanksgiving Day Games (Wednesday and Thursday)
   - K. Doherty JV and Varsity Field Hockey
   - L. Doherty JV and Varsity Boys Soccer
   - M. Doherty JV and Varsity Girls Soccer
   - N. Doherty JV and Varsity Baseball
   - O. City Wide JV and Varsity Boys Lacrosse
   - P. City Wide JV and Varsity Girls Lacrosse
   - Q. Burncoat Boys and Girls Outdoor Track
   - R. Doherty Boys and Girls Outdoor Track
   - S. North/WTHS Boys and Girls Outdoor Track
   - T. South Boys and Girls Outdoor Track
   - U. Main South Boys and Girls Outdoor Track
   - V. WPS JV and Varsity Baseball Teams when the city has not released their fields
   - W. Main South JV and Varsity Boys Soccer
   - X. Main South JV Girls Soccer
   - Y. North JV and Varsity Boys Soccer

2. Concessions at various athletic events used for added revenue for the Worcester Public Schools, along with ticket sales for Varsity Football games.

3. Rentals at Foley Stadium:
   - A. Worcester World Cup
   - B. Worcester Field Hockey
   - C. Worcester Wildcats
   - D. MIAA playoffs for Soccer and Football
   - E. Worcester Cowboys
   - F. Local High Schools and College needing fields
   - G. Miss Q's Camp Quest 5K
   - H. ALS Walk
   - I. WPS Passing League
   - J. WPS Field Hockey Camp
   - K. Plus others that rent Foley Stadium throughout the year

4. Seasons and times that Foley Stadium is utilized:
    A. Fall: Monday – Thursday 2:00 – 7:00 pm
    Friday 2:00 - 9:00 pm
    Saturday 8:00 am - 3:00 pm
    Sunday Depends on rentals

    B. Winter: Foley Stadium is closed from December through the middle of March

    C. Spring: Monday – Friday 2:00 - 7:00pm
    Saturday 8:00 am – 3:00 pm and depends on rentals
    Sunday Depends on rentals

    D. Summer: Depends on rentals – No WPS teams due to summer break

5. Mini Olympics Fall and Spring, run through the Physical Education Department

Chandler Magnet Field Usage January 1, 2018 through October 4, 2019

No.	Location	Event Start Date	Event Title	Schedule ID	Building	Room	Organization
1	Chandler Magnet	3/26/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
2	Chandler Magnet	3/28/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
3	Chandler Magnet	3/30/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
4	Chandler Magnet	4/1/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
5	Chandler Magnet	4/2/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
6	Chandler Magnet	4/2/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
7	Chandler Magnet	4/3/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
8	Chandler Magnet	4/4/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
9	Chandler Magnet	4/4/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
10	Chandler Magnet	4/5/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
11	Chandler Magnet	4/6/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
12	Chandler Magnet	4/6/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
13	Chandler Magnet	4/7/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
14	Chandler Magnet	4/8/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
15	Chandler Magnet	4/9/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
16	Chandler Magnet	4/9/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
17	Chandler Magnet	4/10/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
18	Chandler Magnet	4/11/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
19	Chandler Magnet	4/11/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
20	Chandler Magnet	4/12/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
21	Chandler Magnet	4/13/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
22	Chandler Magnet	4/13/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League

23	Chandler Magnet	4/14/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
24	Chandler Magnet	4/15/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
25	Chandler Magnet	4/16/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
26	Chandler Magnet	4/16/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
27	Chandler Magnet	4/16/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
28	Chandler Magnet	4/17/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
29	Chandler Magnet	4/17/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
30	Chandler Magnet	4/18/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
31	Chandler Magnet	4/18/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
32	Chandler Magnet	4/18/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
33	Chandler Magnet	4/19/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
34	Chandler Magnet	4/19/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
35	Chandler Magnet	4/20/2018	WSU Club Lacrosse Team Practice	13720	Chandler Magnet School	Fields (Elementary)	Worcester State University Club Lacrosse Team
36	Chandler Magnet	4/20/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
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38	Chandler Magnet	4/21/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
39	Chandler Magnet	4/21/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
40	Chandler Magnet	4/22/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
41	Chandler Magnet	4/23/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
42	Chandler Magnet	4/23/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
43	Chandler Magnet	4/24/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
44	Chandler Magnet	4/24/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
45	Chandler Magnet	4/25/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
46	Chandler Magnet	4/25/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
47	Chandler Magnet	4/26/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
48	Chandler Magnet	4/26/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League

49	Chandler Magnet	4/27/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
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51	Chandler Magnet	4/28/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
52	Chandler Magnet	4/28/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
53	Chandler Magnet	4/29/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
54	Chandler Magnet	4/30/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
55	Chandler Magnet	4/30/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
56	Chandler Magnet	5/1/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
57	Chandler Magnet	5/1/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
58	Chandler Magnet	5/1/2018	Camp Italia Retreat (Chandler Mag)	13885	Chandler Magnet School	Soccer Field	Camp Italia Retreat
59	Chandler Magnet	5/2/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
60	Chandler Magnet	5/2/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
61	Chandler Magnet	5/3/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
62	Chandler Magnet	5/3/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
63	Chandler Magnet	5/3/2018	Camp Italia Retreat (Chandler Mag)	13885	Chandler Magnet School	Soccer Field	Camp Italia Retreat
64	Chandler Magnet	5/4/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
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94	Chandler Magnet	5/20/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
95	Chandler Magnet	5/21/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
96	Chandler Magnet	5/21/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
97	Chandler Magnet	5/22/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
98	Chandler Magnet	5/22/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
99	Chandler Magnet	5/23/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
100	Chandler Magnet	5/23/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
101	Chandler Magnet	5/24/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett

102	Chandler Magnet	5/24/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
103	Chandler Magnet	5/25/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
104	Chandler Magnet	5/25/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
105	Chandler Magnet	5/26/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
106	Chandler Magnet	5/26/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
107	Chandler Magnet	5/27/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
108	Chandler Magnet	5/28/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
109	Chandler Magnet	5/28/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
110	Chandler Magnet	5/29/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
111	Chandler Magnet	5/29/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
112	Chandler Magnet	5/30/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
113	Chandler Magnet	5/30/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
114	Chandler Magnet	5/31/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
115	Chandler Magnet	5/31/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
116	Chandler Magnet	6/1/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
117	Chandler Magnet	6/1/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
118	Chandler Magnet	6/2/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
119	Chandler Magnet	6/2/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
120	Chandler Magnet	6/3/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
121	Chandler Magnet	6/4/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
122	Chandler Magnet	6/4/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
123	Chandler Magnet	6/5/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
124	Chandler Magnet	6/5/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
125	Chandler Magnet	6/6/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
126	Chandler Magnet	6/6/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
127	Chandler Magnet	6/7/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett

128	Chandler Magnet	6/7/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
129	Chandler Magnet	6/8/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
130	Chandler Magnet	6/8/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
131	Chandler Magnet	6/9/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
132	Chandler Magnet	6/9/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
133	Chandler Magnet	6/10/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
134	Chandler Magnet	6/11/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
135	Chandler Magnet	6/11/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
136	Chandler Magnet	6/12/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
137	Chandler Magnet	6/12/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
138	Chandler Magnet	6/13/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
139	Chandler Magnet	6/13/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
140	Chandler Magnet	6/14/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
141	Chandler Magnet	6/14/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
142	Chandler Magnet	6/15/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
143	Chandler Magnet	6/15/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
144	Chandler Magnet	6/16/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
145	Chandler Magnet	6/16/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
146	Chandler Magnet	6/17/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
147	Chandler Magnet	6/18/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
148	Chandler Magnet	6/18/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
149	Chandler Magnet	6/19/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
150	Chandler Magnet	6/19/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
151	Chandler Magnet	6/20/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
152	Chandler Magnet	6/20/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
153	Chandler Magnet	6/21/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett

154	Chandler Magnet	6/21/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
155	Chandler Magnet	6/22/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
156	Chandler Magnet	6/22/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
157	Chandler Magnet	6/23/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
158	Chandler Magnet	6/23/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
159	Chandler Magnet	6/24/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
160	Chandler Magnet	6/25/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
161	Chandler Magnet	6/25/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
162	Chandler Magnet	6/26/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
163	Chandler Magnet	6/26/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
164	Chandler Magnet	6/27/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
165	Chandler Magnet	6/27/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
166	Chandler Magnet	6/28/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
167	Chandler Magnet	6/28/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
168	Chandler Magnet	6/29/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
169	Chandler Magnet	6/29/2018	Soccer Practice (Chandler)	13629	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
170	Chandler Magnet	6/30/2018	Soccer Games (Chandler Magnet)	13630	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
171	Chandler Magnet	6/30/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
172	Chandler Magnet	7/2/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
173	Chandler Magnet	7/3/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
174	Chandler Magnet	7/4/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
175	Chandler Magnet	7/5/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
176	Chandler Magnet	7/6/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
177	Chandler Magnet	7/7/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett

178	Chandler Magnet	7/9/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
179	Chandler Magnet	7/10/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
180	Chandler Magnet	7/10/2018	Camp Italia Retreat (Chandler Mag)	13885	Chandler Magnet School	Soccer Field	Camp Italia Retreat
181	Chandler Magnet	7/11/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
182	Chandler Magnet	7/12/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
183	Chandler Magnet	7/12/2018	Camp Italia Retreat (Chandler Mag)	13885	Chandler Magnet School	Soccer Field	Camp Italia Retreat
184	Chandler Magnet	7/13/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
185	Chandler Magnet	7/14/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
186	Chandler Magnet	7/16/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
187	Chandler Magnet	7/17/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
188	Chandler Magnet	7/18/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
189	Chandler Magnet	7/19/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
190	Chandler Magnet	7/20/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
191	Chandler Magnet	7/21/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
192	Chandler Magnet	7/23/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
193	Chandler Magnet	7/24/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
194	Chandler Magnet	7/25/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
195	Chandler Magnet	7/26/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
196	Chandler Magnet	7/27/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
197	Chandler Magnet	7/28/2018	Liberian Independence Day Program (Chandler Mag)	14202	Chandler Magnet School	Soccer Field	Liberian Association Of Worcester County
198	Chandler Magnet	7/28/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
199	Chandler Magnet	7/29/2018	Liberian Independence Day Program (Chandler Mag)	14202	Chandler Magnet School	Soccer Field	Liberian Association Of Worcester County

200	Chandler Magnet	7/30/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
201	Chandler Magnet	7/31/2018	Jesse Burkett LL practices	13799	Chandler Magnet School	Fields (Elementary)	Jesse Burkett
202	Chandler Magnet	8/6/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
203	Chandler Magnet	8/8/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
204	Chandler Magnet	8/10/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
205	Chandler Magnet	8/13/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
206	Chandler Magnet	8/15/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
207	Chandler Magnet	8/17/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
208	Chandler Magnet	8/20/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
209	Chandler Magnet	8/20/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
210	Chandler Magnet	8/21/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
211	Chandler Magnet	8/21/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
212	Chandler Magnet	8/22/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
213	Chandler Magnet	8/22/2018	Soccer Coaching (Chandler Mag)	14340	Chandler Magnet School	Soccer Field	Simba Rising Stars
214	Chandler Magnet	8/22/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
215	Chandler Magnet	8/22/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
216	Chandler Magnet	8/23/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
217	Chandler Magnet	8/23/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
218	Chandler Magnet	8/24/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
219	Chandler Magnet	8/24/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
220	Chandler Magnet	8/25/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
221	Chandler Magnet	8/26/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
222	Chandler Magnet	8/27/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League

223	Chandler Magnet	8/28/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
224	Chandler Magnet	8/28/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
225	Chandler Magnet	8/29/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
226	Chandler Magnet	8/29/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
227	Chandler Magnet	8/29/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
228	Chandler Magnet	8/30/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
229	Chandler Magnet	8/30/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
230	Chandler Magnet	8/31/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
231	Chandler Magnet	8/31/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
232	Chandler Magnet	9/1/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
233	Chandler Magnet	9/1/2018	Chandler Magnet Cleanup	14543	Chandler Magnet School	Fields (Elementary)	Chandler Magnet
234	Chandler Magnet	9/2/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
235	Chandler Magnet	9/3/2018	Chandler Magnet Cleanup	14543	Chandler Magnet School	Fields (Elementary)	Chandler Magnet
236	Chandler Magnet	9/3/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
237	Chandler Magnet	9/4/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
238	Chandler Magnet	9/4/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
239	Chandler Magnet	9/5/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
240	Chandler Magnet	9/5/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
241	Chandler Magnet	9/5/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
242	Chandler Magnet	9/6/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
243	Chandler Magnet	9/6/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
244	Chandler Magnet	9/7/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
245	Chandler Magnet	9/7/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
246	Chandler Magnet	9/8/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
247	Chandler Magnet	9/9/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
248	Chandler Magnet	9/10/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League

249	Chandler Magnet	9/11/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
250	Chandler Magnet	9/11/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
251	Chandler Magnet	9/12/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
252	Chandler Magnet	9/12/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
253	Chandler Magnet	9/12/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
254	Chandler Magnet	9/13/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
255	Chandler Magnet	9/13/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
256	Chandler Magnet	9/14/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
257	Chandler Magnet	9/14/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
258	Chandler Magnet	9/15/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
259	Chandler Magnet	9/16/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
260	Chandler Magnet	9/17/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
261	Chandler Magnet	9/18/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
262	Chandler Magnet	9/18/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
263	Chandler Magnet	9/19/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
264	Chandler Magnet	9/19/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
265	Chandler Magnet	9/19/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
266	Chandler Magnet	9/20/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
267	Chandler Magnet	9/20/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
268	Chandler Magnet	9/21/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
269	Chandler Magnet	9/21/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
270	Chandler Magnet	9/22/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
271	Chandler Magnet	9/23/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
272	Chandler Magnet	9/24/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
273	Chandler Magnet	9/25/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
274	Chandler Magnet	9/25/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED

275	Chandler Magnet	9/26/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
276	Chandler Magnet	9/26/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
277	Chandler Magnet	9/26/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
278	Chandler Magnet	9/27/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
279	Chandler Magnet	9/27/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
280	Chandler Magnet	9/28/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
281	Chandler Magnet	9/28/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
282	Chandler Magnet	9/29/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
283	Chandler Magnet	9/30/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
284	Chandler Magnet	10/1/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
285	Chandler Magnet	10/2/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
286	Chandler Magnet	10/2/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
287	Chandler Magnet	10/3/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
288	Chandler Magnet	10/3/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
289	Chandler Magnet	10/3/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
290	Chandler Magnet	10/4/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
291	Chandler Magnet	10/4/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
292	Chandler Magnet	10/5/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
293	Chandler Magnet	10/5/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
294	Chandler Magnet	10/6/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
295	Chandler Magnet	10/7/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
296	Chandler Magnet	10/8/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
297	Chandler Magnet	10/9/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
298	Chandler Magnet	10/9/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
299	Chandler Magnet	10/10/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League

300	Chandler Magnet	10/10/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
301	Chandler Magnet	10/10/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
302	Chandler Magnet	10/11/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
303	Chandler Magnet	10/11/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
304	Chandler Magnet	10/12/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
305	Chandler Magnet	10/12/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
306	Chandler Magnet	10/13/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
307	Chandler Magnet	10/14/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
308	Chandler Magnet	10/15/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
309	Chandler Magnet	10/16/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
310	Chandler Magnet	10/16/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
311	Chandler Magnet	10/17/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
312	Chandler Magnet	10/17/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
313	Chandler Magnet	10/17/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
314	Chandler Magnet	10/18/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
315	Chandler Magnet	10/18/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
316	Chandler Magnet	10/19/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
317	Chandler Magnet	10/19/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
318	Chandler Magnet	10/20/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
319	Chandler Magnet	10/21/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
320	Chandler Magnet	10/22/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
321	Chandler Magnet	10/23/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
322	Chandler Magnet	10/23/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
323	Chandler Magnet	10/24/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
324	Chandler Magnet	10/24/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
325	Chandler Magnet	10/24/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football

326	Chandler Magnet	10/25/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
327	Chandler Magnet	10/25/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
328	Chandler Magnet	10/26/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
329	Chandler Magnet	10/26/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
330	Chandler Magnet	10/27/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
331	Chandler Magnet	10/28/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
332	Chandler Magnet	10/29/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
333	Chandler Magnet	10/30/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
334	Chandler Magnet	10/30/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
335	Chandler Magnet	10/31/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
336	Chandler Magnet	10/31/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
337	Chandler Magnet	10/31/2018	Worcester Youth Flag Football (Chandler Mag)	14415	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
338	Chandler Magnet	11/1/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
339	Chandler Magnet	11/1/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
340	Chandler Magnet	11/2/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
341	Chandler Magnet	11/2/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
342	Chandler Magnet	11/3/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
343	Chandler Magnet	11/4/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
344	Chandler Magnet	11/5/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
345	Chandler Magnet	11/6/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
346	Chandler Magnet	11/6/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
347	Chandler Magnet	11/7/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
348	Chandler Magnet	11/7/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
349	Chandler Magnet	11/8/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
350	Chandler Magnet	11/8/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED

351	Chandler Magnet	11/9/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
352	Chandler Magnet	11/9/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
353	Chandler Magnet	11/10/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
354	Chandler Magnet	11/11/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
355	Chandler Magnet	11/12/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
356	Chandler Magnet	11/13/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
357	Chandler Magnet	11/13/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
358	Chandler Magnet	11/14/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
359	Chandler Magnet	11/14/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
360	Chandler Magnet	11/15/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
361	Chandler Magnet	11/15/2018	Soccer Practice (Chandler Mag)	14174	Chandler Magnet School	Fields (Elementary)	FC EAGLE UNITED
362	Chandler Magnet	11/16/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
363	Chandler Magnet	11/17/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
364	Chandler Magnet	11/18/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
365	Chandler Magnet	11/19/2018	Soccer Practice (Chandler Mag)	14388	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
366	Chandler Magnet	11/24/2018	Soccer games (Chandler Mag)	14389	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
367	Chandler Magnet	4/1/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
368	Chandler Magnet	4/1/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
369	Chandler Magnet	4/2/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
370	Chandler Magnet	4/2/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
371	Chandler Magnet	4/3/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
372	Chandler Magnet	4/3/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
373	Chandler Magnet	4/4/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
374	Chandler Magnet	4/4/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

375	Chandler Magnet	4/5/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
376	Chandler Magnet	4/5/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
377	Chandler Magnet	4/6/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
378	Chandler Magnet	4/6/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
379	Chandler Magnet	4/6/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
380	Chandler Magnet	4/7/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
381	Chandler Magnet	4/7/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
382	Chandler Magnet	4/7/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
383	Chandler Magnet	4/8/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
384	Chandler Magnet	4/8/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
385	Chandler Magnet	4/9/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
386	Chandler Magnet	4/9/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
387	Chandler Magnet	4/10/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
388	Chandler Magnet	4/10/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
389	Chandler Magnet	4/11/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
390	Chandler Magnet	4/11/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
391	Chandler Magnet	4/12/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
392	Chandler Magnet	4/12/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
393	Chandler Magnet	4/13/2019	Working for Worcester Playground Build (Chandler M	15975	Chandler Magnet School	Fields (Elementary)	Working for Worcester
394	Chandler Magnet	4/13/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
395	Chandler Magnet	4/13/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
396	Chandler Magnet	4/13/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
397	Chandler Magnet	4/14/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
398	Chandler Magnet	4/14/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
399	Chandler Magnet	4/14/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
400	Chandler Magnet	4/15/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
401	Chandler Magnet	4/15/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
402	Chandler Magnet	4/15/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

403	Chandler Magnet	4/16/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
404	Chandler Magnet	4/16/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
405	Chandler Magnet	4/16/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
406	Chandler Magnet	4/17/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
407	Chandler Magnet	4/17/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
408	Chandler Magnet	4/17/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
409	Chandler Magnet	4/18/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
410	Chandler Magnet	4/18/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
411	Chandler Magnet	4/18/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
412	Chandler Magnet	4/19/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
413	Chandler Magnet	4/19/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
414	Chandler Magnet	4/19/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
415	Chandler Magnet	4/20/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
416	Chandler Magnet	4/20/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
417	Chandler Magnet	4/20/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
418	Chandler Magnet	4/21/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
419	Chandler Magnet	4/21/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
420	Chandler Magnet	4/21/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
421	Chandler Magnet	4/22/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
422	Chandler Magnet	4/22/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
423	Chandler Magnet	4/22/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
424	Chandler Magnet	4/23/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
425	Chandler Magnet	4/23/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
426	Chandler Magnet	4/23/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
427	Chandler Magnet	4/24/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
428	Chandler Magnet	4/24/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
429	Chandler Magnet	4/24/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
430	Chandler Magnet	4/25/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
431	Chandler Magnet	4/25/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
432	Chandler Magnet	4/25/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

433	Chandler Magnet	4/26/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
434	Chandler Magnet	4/26/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
435	Chandler Magnet	4/26/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
436	Chandler Magnet	4/27/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
437	Chandler Magnet	4/27/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
438	Chandler Magnet	4/27/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
439	Chandler Magnet	4/28/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
440	Chandler Magnet	4/28/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
441	Chandler Magnet	4/28/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
442	Chandler Magnet	4/29/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
443	Chandler Magnet	4/29/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
444	Chandler Magnet	4/29/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
445	Chandler Magnet	4/30/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
446	Chandler Magnet	4/30/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
447	Chandler Magnet	4/30/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
448	Chandler Magnet	5/1/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
449	Chandler Magnet	5/1/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
450	Chandler Magnet	5/1/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
451	Chandler Magnet	5/2/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
452	Chandler Magnet	5/2/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
453	Chandler Magnet	5/2/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
454	Chandler Magnet	5/3/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
455	Chandler Magnet	5/3/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
456	Chandler Magnet	5/3/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
457	Chandler Magnet	5/4/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
458	Chandler Magnet	5/4/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
459	Chandler Magnet	5/4/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
460	Chandler Magnet	5/5/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
461	Chandler Magnet	5/5/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
462	Chandler Magnet	5/5/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

463	Chandler Magnet	5/6/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
464	Chandler Magnet	5/6/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
465	Chandler Magnet	5/6/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
466	Chandler Magnet	5/7/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
467	Chandler Magnet	5/7/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
468	Chandler Magnet	5/7/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
469	Chandler Magnet	5/8/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
470	Chandler Magnet	5/8/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
471	Chandler Magnet	5/8/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
472	Chandler Magnet	5/9/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
473	Chandler Magnet	5/9/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
474	Chandler Magnet	5/9/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
475	Chandler Magnet	5/10/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
476	Chandler Magnet	5/10/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
477	Chandler Magnet	5/10/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
478	Chandler Magnet	5/11/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
479	Chandler Magnet	5/11/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
480	Chandler Magnet	5/11/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
481	Chandler Magnet	5/12/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
482	Chandler Magnet	5/12/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
483	Chandler Magnet	5/12/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
484	Chandler Magnet	5/13/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
485	Chandler Magnet	5/13/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
486	Chandler Magnet	5/13/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
487	Chandler Magnet	5/14/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
488	Chandler Magnet	5/14/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
489	Chandler Magnet	5/14/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
490	Chandler Magnet	5/15/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
491	Chandler Magnet	5/15/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
492	Chandler Magnet	5/15/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

493	Chandler Magnet	5/16/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
494	Chandler Magnet	5/16/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
495	Chandler Magnet	5/16/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
496	Chandler Magnet	5/17/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
497	Chandler Magnet	5/17/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
498	Chandler Magnet	5/17/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
499	Chandler Magnet	5/18/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
500	Chandler Magnet	5/18/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
501	Chandler Magnet	5/18/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
502	Chandler Magnet	5/19/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
503	Chandler Magnet	5/19/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
504	Chandler Magnet	5/19/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
505	Chandler Magnet	5/20/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
506	Chandler Magnet	5/20/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
507	Chandler Magnet	5/20/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
508	Chandler Magnet	5/21/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
509	Chandler Magnet	5/21/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
510	Chandler Magnet	5/21/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
511	Chandler Magnet	5/22/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
512	Chandler Magnet	5/22/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
513	Chandler Magnet	5/22/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
514	Chandler Magnet	5/23/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
515	Chandler Magnet	5/23/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
516	Chandler Magnet	5/23/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
517	Chandler Magnet	5/24/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
518	Chandler Magnet	5/24/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
519	Chandler Magnet	5/24/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
520	Chandler Magnet	5/25/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
521	Chandler Magnet	5/25/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
522	Chandler Magnet	5/25/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

523	Chandler Magnet	5/26/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
524	Chandler Magnet	5/26/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
525	Chandler Magnet	5/26/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
526	Chandler Magnet	5/27/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
527	Chandler Magnet	5/27/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
528	Chandler Magnet	5/27/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
529	Chandler Magnet	5/28/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
530	Chandler Magnet	5/28/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
531	Chandler Magnet	5/28/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
532	Chandler Magnet	5/29/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
533	Chandler Magnet	5/29/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
534	Chandler Magnet	5/29/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
535	Chandler Magnet	5/30/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
536	Chandler Magnet	5/30/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
537	Chandler Magnet	5/30/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
538	Chandler Magnet	5/31/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
539	Chandler Magnet	5/31/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
540	Chandler Magnet	5/31/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
541	Chandler Magnet	6/1/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
542	Chandler Magnet	6/1/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
543	Chandler Magnet	6/1/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
544	Chandler Magnet	6/2/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
545	Chandler Magnet	6/2/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
546	Chandler Magnet	6/2/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
547	Chandler Magnet	6/3/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
548	Chandler Magnet	6/3/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
549	Chandler Magnet	6/3/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
550	Chandler Magnet	6/4/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
551	Chandler Magnet	6/4/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
552	Chandler Magnet	6/4/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

553	Chandler Magnet	6/5/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
554	Chandler Magnet	6/5/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
555	Chandler Magnet	6/5/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
556	Chandler Magnet	6/6/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
557	Chandler Magnet	6/6/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
558	Chandler Magnet	6/6/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
559	Chandler Magnet	6/7/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
560	Chandler Magnet	6/7/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
561	Chandler Magnet	6/7/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
562	Chandler Magnet	6/8/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
563	Chandler Magnet	6/8/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
564	Chandler Magnet	6/8/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
565	Chandler Magnet	6/9/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
566	Chandler Magnet	6/9/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
567	Chandler Magnet	6/9/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
568	Chandler Magnet	6/10/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
569	Chandler Magnet	6/10/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
570	Chandler Magnet	6/10/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
571	Chandler Magnet	6/11/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
572	Chandler Magnet	6/11/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
573	Chandler Magnet	6/11/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
574	Chandler Magnet	6/12/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
575	Chandler Magnet	6/12/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
576	Chandler Magnet	6/12/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
577	Chandler Magnet	6/13/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
578	Chandler Magnet	6/13/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
579	Chandler Magnet	6/13/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
580	Chandler Magnet	6/14/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
581	Chandler Magnet	6/14/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
582	Chandler Magnet	6/14/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

583	Chandler Magnet	6/15/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
584	Chandler Magnet	6/15/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
585	Chandler Magnet	6/15/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
586	Chandler Magnet	6/16/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
587	Chandler Magnet	6/16/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
588	Chandler Magnet	6/16/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
589	Chandler Magnet	6/17/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
590	Chandler Magnet	6/17/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
591	Chandler Magnet	6/17/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
592	Chandler Magnet	6/18/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
593	Chandler Magnet	6/18/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
594	Chandler Magnet	6/18/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
595	Chandler Magnet	6/19/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
596	Chandler Magnet	6/19/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
597	Chandler Magnet	6/19/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
598	Chandler Magnet	6/20/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
599	Chandler Magnet	6/20/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
600	Chandler Magnet	6/20/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
601	Chandler Magnet	6/21/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
602	Chandler Magnet	6/21/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
603	Chandler Magnet	6/21/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
604	Chandler Magnet	6/22/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
605	Chandler Magnet	6/22/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
606	Chandler Magnet	6/22/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
607	Chandler Magnet	6/23/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
608	Chandler Magnet	6/23/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
609	Chandler Magnet	6/23/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
610	Chandler Magnet	6/24/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
611	Chandler Magnet	6/24/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
612	Chandler Magnet	6/24/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League

613	Chandler Magnet	6/25/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
614	Chandler Magnet	6/25/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
615	Chandler Magnet	6/25/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
616	Chandler Magnet	6/26/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
617	Chandler Magnet	6/26/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
618	Chandler Magnet	6/26/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
619	Chandler Magnet	6/27/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
620	Chandler Magnet	6/27/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
621	Chandler Magnet	6/27/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
622	Chandler Magnet	6/28/2019	Jesse Burkett LL Practices (Chandler Mag)	15908	Chandler Magnet School	Fields (Elementary)	Jesse Burkett Little League
623	Chandler Magnet	6/28/2019	Soccer Practice (Chandler Mag)	15709	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
624	Chandler Magnet	6/28/2019	Soccer Practice (Chandler Mag)	15712	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
625	Chandler Magnet	6/29/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
626	Chandler Magnet	6/30/2019	Soccer Games	15713	Chandler Magnet School	Soccer Field	Worcester Youth Soccer League
627	Chandler Magnet	7/10/2019	Soccer practice (Chandler Mag)	16515	Chandler Magnet School	Soccer Field	Middle TN Soccer Alliance
628	Chandler Magnet	7/27/2019	INDEPENDENCE DAY CELEBRATION (Chandler Mag)	16543	Chandler Magnet School	Fields (Elementary)	Liberian Association Of Worcester County
629	Chandler Magnet	7/27/2019	INDEPENDENCE DAY CELEBRATION	16544	Chandler Magnet School	Fields (Elementary)	Liberian Association Of Worcester County
630	Chandler Magnet	7/28/2019	INDEPENDENCE DAY CELEBRATION (Chandler Mag)	16543	Chandler Magnet School	Fields (Elementary)	Liberian Association Of Worcester County
631	Chandler Magnet	7/28/2019	INDEPENDENCE DAY CELEBRATION	16544	Chandler Magnet School	Fields (Elementary)	Liberian Association Of Worcester County
632	Chandler Magnet	8/3/2019	Ecuadorian Community Independence Day (Chan Mag)	16640	Chandler Magnet School	Fields (Elementary)	Ecuadorian Community
633	Chandler Magnet	8/24/2019	LIBERIAN ASSOCIATION OF WORCESTER COUNTY- Chan Mag	16547	Chandler Magnet School	Fields (Elementary)	Liberian Association Of Worcester County
634	Chandler Magnet	8/25/2019	LIBERIAN ASSOCIATION OF WORCESTER COUNTY- Chan Mag	16547	Chandler Magnet School	Fields (Elementary)	Liberian Association Of Worcester County
635	Chandler Magnet	8/26/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
636	Chandler Magnet	8/26/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
637	Chandler Magnet	8/27/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League

638	Chandler Magnet	8/27/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
639	Chandler Magnet	8/28/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
640	Chandler Magnet	8/28/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
641	Chandler Magnet	8/28/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
642	Chandler Magnet	8/29/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
643	Chandler Magnet	8/29/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
644	Chandler Magnet	8/29/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
645	Chandler Magnet	8/30/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
646	Chandler Magnet	8/30/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
647	Chandler Magnet	8/30/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
648	Chandler Magnet	8/31/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
649	Chandler Magnet	8/31/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
650	Chandler Magnet	9/1/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
651	Chandler Magnet	9/1/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
652	Chandler Magnet	9/2/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
653	Chandler Magnet	9/2/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
654	Chandler Magnet	9/2/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
655	Chandler Magnet	9/3/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
656	Chandler Magnet	9/3/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
657	Chandler Magnet	9/3/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
658	Chandler Magnet	9/4/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
659	Chandler Magnet	9/4/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
660	Chandler Magnet	9/4/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
661	Chandler Magnet	9/5/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
662	Chandler Magnet	9/5/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
663	Chandler Magnet	9/5/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
664	Chandler Magnet	9/6/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
665	Chandler Magnet	9/6/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
666	Chandler Magnet	9/6/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football

667	Chandler Magnet	9/7/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
668	Chandler Magnet	9/7/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
669	Chandler Magnet	9/8/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
670	Chandler Magnet	9/8/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
671	Chandler Magnet	9/9/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
672	Chandler Magnet	9/9/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
673	Chandler Magnet	9/9/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
674	Chandler Magnet	9/10/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
675	Chandler Magnet	9/10/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
676	Chandler Magnet	9/10/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
677	Chandler Magnet	9/11/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
678	Chandler Magnet	9/11/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
679	Chandler Magnet	9/11/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
680	Chandler Magnet	9/12/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
681	Chandler Magnet	9/12/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
682	Chandler Magnet	9/12/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
683	Chandler Magnet	9/13/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
684	Chandler Magnet	9/13/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
685	Chandler Magnet	9/13/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
686	Chandler Magnet	9/14/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
687	Chandler Magnet	9/14/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
688	Chandler Magnet	9/15/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
689	Chandler Magnet	9/15/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
690	Chandler Magnet	9/16/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
691	Chandler Magnet	9/16/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
692	Chandler Magnet	9/16/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
693	Chandler Magnet	9/17/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
694	Chandler Magnet	9/17/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
695	Chandler Magnet	9/17/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football

696	Chandler Magnet	9/18/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
697	Chandler Magnet	9/18/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
698	Chandler Magnet	9/18/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
699	Chandler Magnet	9/19/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
700	Chandler Magnet	9/19/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
701	Chandler Magnet	9/19/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
702	Chandler Magnet	9/20/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
703	Chandler Magnet	9/20/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
704	Chandler Magnet	9/20/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
705	Chandler Magnet	9/21/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
706	Chandler Magnet	9/21/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
707	Chandler Magnet	9/22/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
708	Chandler Magnet	9/22/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
709	Chandler Magnet	9/23/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
710	Chandler Magnet	9/23/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
711	Chandler Magnet	9/23/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
712	Chandler Magnet	9/24/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
713	Chandler Magnet	9/24/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
714	Chandler Magnet	9/24/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
715	Chandler Magnet	9/25/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
716	Chandler Magnet	9/25/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
717	Chandler Magnet	9/25/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
718	Chandler Magnet	9/26/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
719	Chandler Magnet	9/26/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
720	Chandler Magnet	9/26/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
721	Chandler Magnet	9/27/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
722	Chandler Magnet	9/27/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
723	Chandler Magnet	9/27/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
724	Chandler Magnet	9/28/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
725	Chandler Magnet	9/28/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League

726	Chandler Magnet	9/29/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
727	Chandler Magnet	9/29/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
728	Chandler Magnet	9/30/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
729	Chandler Magnet	9/30/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
730	Chandler Magnet	9/30/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
731	Chandler Magnet	10/1/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
732	Chandler Magnet	10/1/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
733	Chandler Magnet	10/1/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
734	Chandler Magnet	10/2/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
735	Chandler Magnet	10/2/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
736	Chandler Magnet	10/2/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
737	Chandler Magnet	10/3/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
738	Chandler Magnet	10/3/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
739	Chandler Magnet	10/3/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football
740	Chandler Magnet	10/4/2019	WYSL Game Times (Chandler Mag)	16821	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
741	Chandler Magnet	10/4/2019	WYSL Practice (Chandler Mag)	16820	Chandler Magnet School	Fields (Elementary)	Worcester Youth Soccer League
742	Chandler Magnet	10/4/2019	Worcester Youth Flag Football (Chandler Mag)	16874	Chandler Magnet School	Fields (Elementary)	Worcester Youth Flag Football

Beaver Brook Park 2

WORCESTER
Geographic Information System

DATA SOURCES:
Basemap data: City of Worcester, MA Geographic Information System
Original Data - Digitized at 1:480 scale (Data true resolution: 1 inch = 40 feet).
Updated Using Spring 2003 Photography at 1 inch = 100 feet
Further Updates Using City of Worcester Information
Property Details: City of Worcester, MA Assessing Division

COORDINATE SYSTEM:
All map data is in the Massachusetts State Plane Coordinate system,
North American Datum of 1983, Massachusetts Mainland Zone (4151).
Units are measured in Feet.

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www.worcesterma.gov September 27, 2019 1" = 139 ft

NORTH

- • Hydrants
- Parcels
- City

CITY OF WORCESTER
DEPARTMENT OF PUBLIC WORKS AND PARKS
Parks, Recreation and Cemetery Division   50 Skyline Drive   Worcester, MA   01605-2898

Paul J. Moosey, P.E.
Commissioner

Robert C. Antonelli, Jr., CPRP
Assistant Commissioner

(508) 799-1190
(508) 799-1293 FAX

Edward M. Augustus, Jr., City Manager

Beaver Brook Little League Field #1 & #2
Beaver Brook Open Spaces A, B, C & D
Ted Williams:

April 1st through August 31st
Sunday through Saturday
8:00 AM to 10:00 PM

Beaver Brook Football Field
Beaver Brook Open Spaces A, B, C & D
Worcester Vikings Youth Football:

August 1st through December 31st
Sunday through Saturday
8:00 AM to 10:00 PM

Beaver Brook Football Field
Field Maintenance

January 1st through July 31st
Sunday through Saturday
8:00 AM to 10:00 PM

Beaver Brook Basketball Court
Worcester PAAL – Youth Camps:

May through August
Tuesdays, Wednesdays & Thursdays
4:30 PM – 8:30 PM

Skyhawks Youth camp:

One week in August

Beaver Brook Hockey Rink
Worcester Renegades Youth Street Hockey:

May through November 30th
Monday – Friday – 4:00 PM – 10:00 PM
Saturdays & Sundays – 9:00 AM – 1:00 PM

Beaver Brook Softball Field

Worcester Public Schools	April 1st through Mid-June Monday through Friday 2:00 PM – 6:00 PM
Worcester Healthcare Adult League	May 1st through September 1st Mondays & Tuesdays 6:00 PM – 10:00 PM
Central Mass Adult Softball	May 1st through September 1st Wednesdays & Thursdays 6:00 PM – 10:00 PM
Latin Adult Softball League	May 1st through September 1st Saturdays 11:00 AM - 6:00 PM
Central Mass Adult Softball West	May 1st through end of September Sundays 8:00 AM – 12:00 PM
Worcester Vikings Youth Football:	August 1st through August 31st Fridays 5:30 PM to 8:30 PM
	September 1st through December 31st Tuesday through Friday 5:30 PM to 8:30 PM

Beaver Brook Parking Lot

Worcester Public Schools	September 1st through November 30th Fridays, Saturdays & other days as needed Games at Foley
Worcester Farmer Market	June 1st through November 1st Monday & Fridays 8:00 AM to 1:00 PM

CITY OF WORCESTER
DEPARTMENT OF PUBLIC WORKS AND PARKS
Parks, Recreation and Cemetery Division 50 Skyline Drive Worcester, MA 01605-2898

Paul J. Moosey, P.E.
Commissioner

Robert C. Antonelli, Jr., CPRP
Assistant Commissioner

(508) 799-1190
(508) 799-1293 FAX

Edward M. Augustus, Jr., City Manager

Newton Hill Tennis Courts 1, 2, 3 & 4
Spaces A, B, C & D

Worcester Public Schools

April 1st through Mid-June
Monday through Friday
2:00 PM – 6:00 PM

Tenacity

July 1st through August 31st
Monday through Friday
9:00 AM – 4:00 PM

Open Public Play

April 1st through October 31st
Sunday through Saturday
Dawn – 10:00 PM (or outside above permits)

Newton Hill Basketball Court

Basketball League

June 1st through End of August
Monday, Wednesdays & Thursdays
5:00 PM – 10:00 PM

Open Public Play

April 1st through October 31st
Sunday through Saturday
Dawn – 10:00 PM (or outside above permits)

Duffy Field 2

WORCESTER Geographic Information System

DATA SOURCES:
Basemap data: City of Worcester, MA Geographic Information System
Original Data - Digitized at 1:480 scale (Data true resolution: 1 inch = 40 feet).
Updated Using Spring 2003 Photography at 1 inch = 100 feet
Further Updates Using City of Worcester Information
Property Details: City of Worcester, MA Assessing Division

- ● Hydrants
- Parcels
- City

COORDINATE SYSTEM:
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www.worcesterma.gov September 27, 2019 1" = 278 ft NORTH

Duffy Field

WORCESTER
Geographic Information System

DATA SOURCES:
Basemap data: City of Worcester, MA Geographic Information System
Original Data - Digitized at 1:480 scale (Data true resolution: 1 inch = 40 feet).
Updated Using Spring 2003 Photography at 1 inch = 100 feet
Further Updates Using City of Worcester Information
Property Details: City of Worcester, MA Assessing Division

● Hydrants
Parcels
City

COORDINATE SYSTEM:
All map data is in the Massachusetts State Plane Coordinate system,
North American Datum of 1983, Massachusetts Mainland Zone (4151).
Units are measured in Feet.

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NORTH

www.worcesterma.gov September 27, 2019 1" = 139 ft

CITY OF WORCESTER
DEPARTMENT OF PUBLIC WORKS AND PARKS
Parks, Recreation and Cemetery Division 50 Skyline Drive Worcester, MA 01605-2898

Paul J. Moosey, P.E.
Commissioner

Robert C. Antonelli, Jr., CPRP
Assistant Commissioner

(508) 799-1190
(508) 799-1293 FAX

Edward M. Augustus, Jr., City Manager

Duffy/Wetherall Estate

Multipurpose field

Jesse Burkett Little League	April 1st through September 1st Sunday through Saturday 8:00 AM – 8:00 PM
Greendale Youth Flag Football	September 1st through December 1st Monday through Friday 4:00 PM – 8:00 PM

ATTENDEES:

- **Maureen Binienda** | Superintendent | Worcester Public Schools
- **Sally Maloney** | Principal | Doherty Memorial High School
- **John Staley** | Assistant Principal | DMHS
- **Eugene Caruso** | OPM | Tishman AECOM
- **Rob Para Jr.** | Project Architect | LPA|A
- **Chris Lee** | Project Manager | LPA|A
- **Christina Bazelmans** | Assistant Project Architect | LPA|A

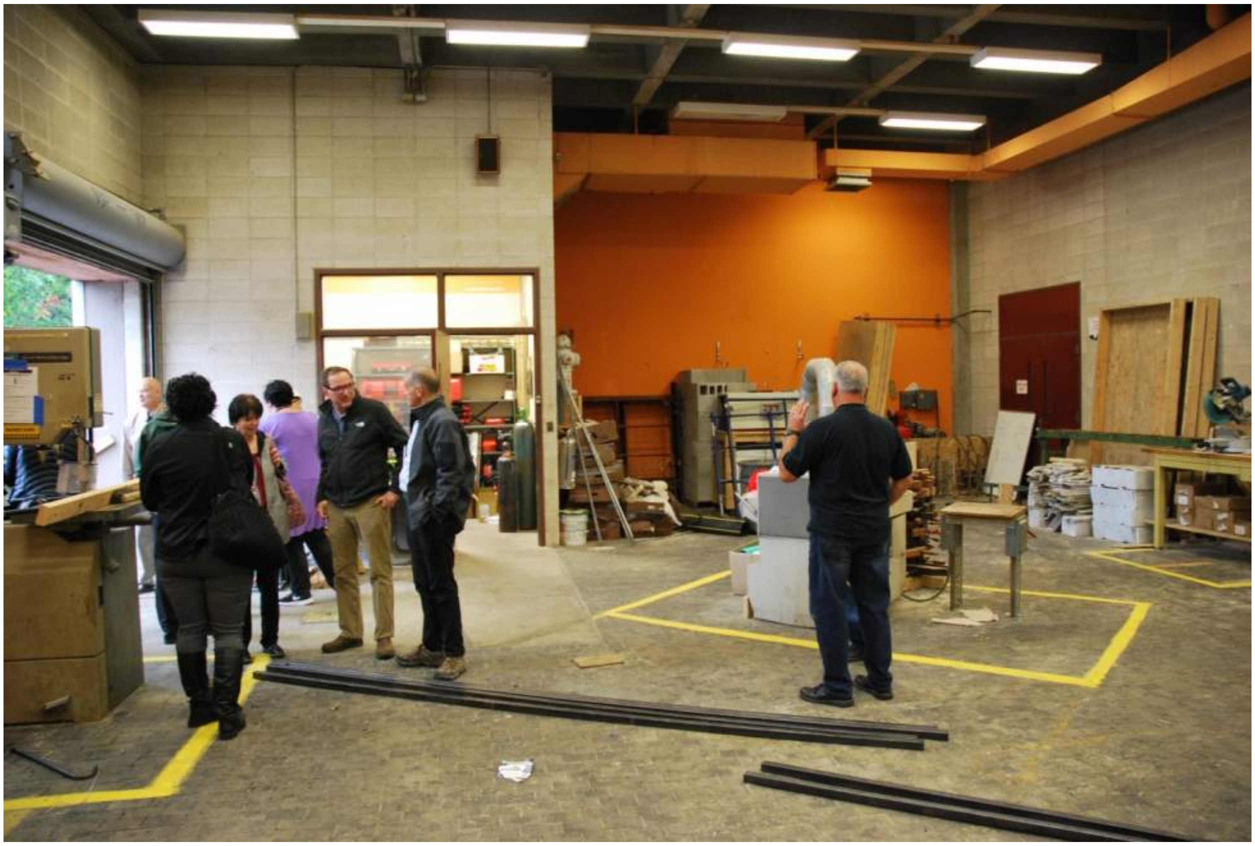
Notes:

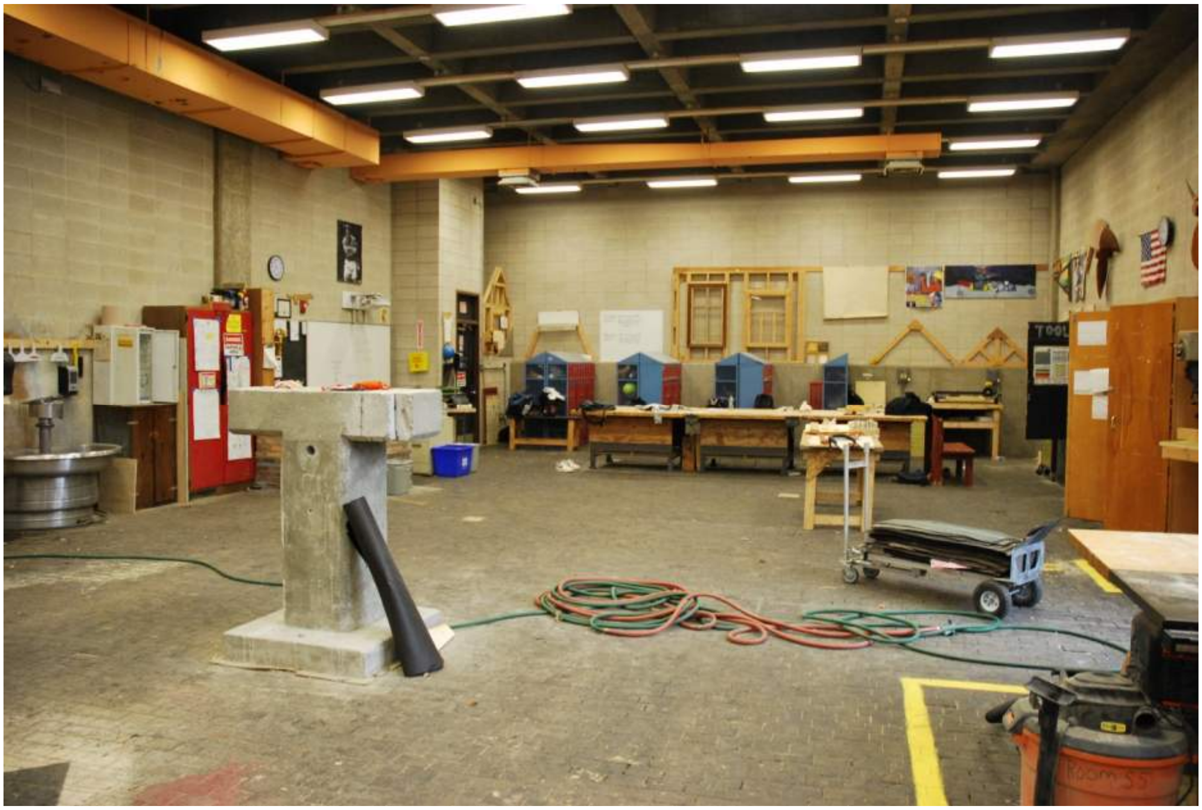
- Chapter 74 Pathways:
    - Cosmetology
    - Culinary Arts
    - Early Education & Care
    - Engineering – Project Lead The Way
    - Environmental Science & Technology
    - Health Assistant
    - Marketing
    - Visual Design
- Non-Chapter 74 Pathways:
    - Construction Craft Laborer
    - Electronics / Robotics
    - Woodworking Technology

- BMC Durfee High School is currently in the midst of a phased-occupied construction project with the existing school will remain functional and occupied throughout construction.
    - The town is renovating the pool and auditorium (separate from the MSBA project) for community use

- Construction Craft Laborer program
    - Currently a Non-Chapter 74 Career Pathway
    - The school is seeking Chapter 74 designation in the new school
    - Strong partnership with the New England Laborers Cooperation Trust

  - Welding outside with Hopkinton Union reps in order to meet strand requirements
  - 2 Teachers for 90 students total
  - Schedule cross over with other disciplines to achieve the required 900 hours
  - The CCL space in the new school will be the size of both existing shops combined





AECOM TISHMAN

School:	**Medford Vocational Technical High School (MVTHS)**	**Date: Friday Oct. 18, 2019**
Location:	489 Winthrop Street Medford MA	
Attendees:	Maureen Binienda, Superintendent WPS Sally Malone, Principal DMHS John Staley, Asst. Principal DHMS Katie Crockett, LPA Eugene Caruso, TCCMA Chad Fallon, Principal/Director, MVTHS	

Subject: School tour – Medford Vocational Technical High School

General Impressions and Notes:

- Vocational HS connected to the regular Medford HS
- 570 students in the VoTech school
- The Chapter 74 program spaces in general were large spaces

- **ROBOTICS** – the CCL students are constructing new Robotics spaces in the lower level of the school.
- Chad sold many items on the Municibid site.
- Three spaces are being built for the robotics; manufacturing, robotics/engineering and computer lab/lecture classroom.
- Existing Robotics is located in a standard type classroom setting. Computers are setup on tables around the perimeter of the room. Two computers per station along with soldering equipment, an oscilloscope and power supply are provided.
- Chairs with arm table are provided in the middle of the classroom for lectures.
- Program focus on software, programming, electronics and mechanics.
- We were shown several projects the students built such as a digital clock and bus route tracker.
- Room had ceiling fans as well.
- There was also a second classroom for the robotics area in addition to two storage rooms.
- One stores room was accessible to students that had well-organized bins, tools, motors, crimping tools, etc. for students to use in their projects.
- The second classroom housed several pieces of heavy equipment.
- Program also includes 3D and 2D printers, Circuit board cutter and cable hanger storage.

- **CONSTRUCTION CRAFT LABOR (CCL)** – program has been operational since 2006.
- This is a very large open area (approx. 80'x80') with high ceilings. Located at the exterior with an overhead door to the outside.
- Program is focused on carpentry, landscaping and concretes works. No plumbing or welding.
- Local 22 out of Hopkinton provides off site training for heavy equipment.
- There was a vertical table saw set up along one wall.
- Included in the area of the CCL space are storage rooms, student lockers, a classroom and staff office. Above the rooms is a second level storage space.
- Along the exterior wall are CMU dividers that provide storage for sand, stone, bricks, CMU and bags of cement.
- The school has a budget of $7,800 per year for supplies.
- There is 38 students plus freshmen, and 2 instructors in the CCL program.
- **PROGRAM AND WEB DEVELOPMENT** – this is the 4th year in the school being offered.
- The program is located in a standard classroom setting with computers on the tables.
- The students learn JAVA and they have a wide range of ability and motivation.
- Opportunity to take online courses with Kahn Academy.
- Python text language is used?
- Microsoft is bringing in computer science to the classroom.
- Teals Program being offered and is a good way for students to interact with professionals.
- Students also work with City officials on the City website.
- Developing a Help Desk and creating web site for school store.
- Students work on a project and at the year-end give a presentation.
- **BIOTECHNOLOGY** – This program was located in a general classroom.
- They are operating a hydronic plant growing area that works in conjunction with a fish pool adjacent to it. The Robotics class designed and built an automatic fish food feeder.
- Additionally, the Biotech students work on growing cancer cells and forensic science issues.
- **BUSINESS MARKETING** - School store managed through the Business program. Store manager is an adult who can cover during school hours when students are not available. Store is located at the Main HS lobby entry.

ATTENDEES:

- Sally Maloney | Principal | Doherty Memorial High School
- John Staley | Assistant Principal | DMHS
- Christina Bazelmans | Assistant Project Architect | LPA|A

Notes:

- This RI Charter School facility supports the Construction Career Academy and the World of Work program, which has a total enrollment of 170.
- The curriculum changes based on labor needs, but focuses heavily on heavy and highway construction skills, including
    - Bridge Construction
    - Asphalt
    - Welding
    - Scaffolding
    - Crane Signaling
    - Line & Grade
    - Utility work
    - Demolition
    - Concrete
- No carpentry, electrical or plumbing is taught due to labor union restrictions.
- Union representatives are the teachers, which is allowed in RI, but not yet in MA
- NEL CPS has 2.5 instructors, and tries to maintain a low student teacher ratio when in the shop (less than 1:15)
- Shop time is different for each grade level
    - 9th and 10th Grades spend the majority of their time in the related theory classroom
    - 11th Grade spends one period per day in the shop, all year long
    - 12th grade spends 3 periods per day in the shop each day, rating A and B
- Shop space has majority dirt/gravel floor (does not need to be deeper than – 6' in a new facility.
- Two large projects must be able to be construction simultaneously, and are in progress for several weeks prior to demolition.

- Large overhead door must allow a cement truck to enter (50% of curriculum is concrete work)
- Scaffolding, demolition and crane signaling occur outside the shop, weather permitting.
- A John Deer Skid Steer with backhoe attachment is an essential piece of equipment for the program.
- The Principal recommends a passenger van or mini bus to take students off site to work on construction projects in the community.
- 2 welding stations are adequate.
- Significant storage for tools is required, the students built a small interior shed for storage.
- The facility is not accessible to a student in a wheel chair.

3.3.5 LOCAL ACTIONS AND APPROVALS

A. Narrative

B. Local Actions & Approvals Certification

C. Certified Copy of SBC Meeting Minutes where PSR Submittal was Approved by Vote

D. SBC & Public Meeting Minutes

E. Press & Media Coverage

3.3.5 LOCAL ACTIONS AND APPROVAL CERTIFICATION

A. Narrative

A proactive community outreach effort has been consistent throughout the Feasibility Study. Some of the key steps include the following:

- The School's web site has been continually updated as the project has progressed:

  https://worcesterschools.org/school-subpage/doherty-memorial-high-school-building-project/

- Public School Building Committee Meetings were held on
  December 9, 2019
  December 18, 2019, vote to submit the PSR to MSBA

Documentation for the above listed items can be found in the section of the submission following this narrative. Additional meetings with City, district, and community stakeholders took place throughout the PSR Phase. Refer to program refinement minutes in Section 3.3.3.H.1.

3.3.5 LOCAL ACTIONS AND APPROVAL CERTIFICATION

B. Local Actions and Approvals Certification

To be added after vote

C. Certified Copy of SBC Meeting Minutes where PSR Submittal was Approved by Vote

To be added after vote

3.3.5 LOCAL ACTIONS AND APPROVAL CERTIFICATION

D. SBC and Public Meeting Minutes

City Of Worcester
DOHERTY MEMORIAL HIGH SCHOOL PROJECT

PUBLIC MEETING / SCHOOL BUILDING COMMITTEE MEETING MINUTES
December 9, 2019 - 6:30-8:00 PM

The following Agenda items were presented and discussed;

- **Introduction:** Russ Adams (CoW) welcomed all attendees and thanked everyone for coming. He introduced the Steering Committee and noted that the School Building Committee would be meeting again on December 18, 2019 to vote on the Preferred Schematic Report (PSR). He introduced Katie Crockett (LPA) to start the presentation.
- **PSR Presentation**: Katie said this presentation is a review of the progress thus far on the PSR portion of the project. The PSR is scheduled to be submitted to the MSBA in December. The project team would then continue work on the Schematic Design which is anticipated to be completed in the summer of 2020. Early construction is scheduled to start in the summer of 2021. She said the team reviewed five options required by the MSBA which include Code Upgrade, Add/Reno, New Construction at Doherty site, Foley Stadium site and Chandler Magnet site plus added land. Work included gathering information on each site, traffic patterns, surveys and budgets that were all used in the analysis for the PSR. The Steering committee has recommended construction on the existing Doherty site for the Preferred solution.
- The project team was tasked to look at various concerns such as construction impact on students, Athletic fields, use of Park lands, existing school use and land acquisition to name a few. The enrollment for the new school is going to be 1,670 students and will include an Advanced Academy and four Chapter 74 programs. We anticipate a 420,000 SF school which is more than double in size of the existing building.
- A perfect 26-acre flat site would be ideal, unfortunately there are none available in the City. We will continue to review parking requirements during the Schematic Design process. In addition to the three sites under consideration, we also reviewed adjacent city property and parks to possibly help augment the athletic program.
- The three options at the existing Doherty site on Highland Street include new construction which will not cause any disruption of the existing Park, puts the playing field on the surface, proposed parking under a portion of the building, designed to step into the site and is considerably lower than the summit of Newton Hill. Katie also stated that none of the existing paths or disc golf at the Park are impacted. The Code upgrade process is a benchmark requirement from the MSBA and would be very expensive, would not meet the program and requires temporary classrooms. The Add/Reno is an inefficient plan, similar in cost to new construction and requires parking under the playing field. Katie introduced Rob Para of LPA to discuss phasing.

- **Phasing Complexities:** Rob stated the construction on the existing Doherty site would be a phased process while the students remain in session throughout construction. Early site work is anticipated to start in the summer of 2021. The construction fencing of the new site area would be first and then the added paving around the existing school to generate temporary parking during construction. The introduction of a CM at Risk Contractor early in the project of this type is beneficial to help with logistics, black out delivery schedules to avoid impact on the students while in school. The first phase would be the completion of the new school, demolition of the existing school building and construct partial parking for a fall 2024 occupancy. The second phase would be completion of all parking, landscaping and athletic fields. The use of vegetated retaining walls is proposed and trees along Highland Street that come down could be replicated during the landscaping phase.

- Foley Stadium site is located on an old swamp site and the stadium was built in the 1920’s. The soils are very poor and not advantageous for building construction requiring piles to support the new school. The area is a dense neighborhood setting and the fields are highly utilized by the whole district. Beaver Brook Park across the street is also in a flood plain. Those fields were reorganized in 2006 to help avoid flooding impacts and the area is best used for fields only.

- Chandler Magnet is located on a 22-acre site, the school was built in the 1950’s for 900 students and needs approximately $7million in repairs. Located across the street from WSU and a new school on the site would be a 4-story building. In order to use this site, land would be required from WSU and the abutting residents. There was also no other facility in the city to relocate the entire school population which is approximately 500 students.

- **Site Rankings:** Katie explained that the Foley Stadium and Chandler Magnet were functioning facilities and there are no current capital plans in the City to replace them. A scoring system was generated to help rank the sites and a perfect score would be 185. The least favorable option was the Code Upgrade with a score of 85 and the Doherty site ranked best at 143 which is the site chosen for the PSR. The cost estimates prepared by both Tishman and LPA confirm a total project budget of approximately $300 million. Katie also mentioned that other off-site options of school lands or city owned land and parks (subject to Article 97) were considered and Rob will present those options.

- **Doherty Off Site Options:** Rob stated that none of the sites provide all the fields desired for the project. The Duffy Field is an existing field and upgrades to make the area a replacement practice field before construction starts would be ideal. The improvements to trails at the Newton Hill were budgeted, the proposed new trail from the school down to the trail to Pleasant Street was not looked on favorably, but other possible improvements to pathways and upgrade to existing tennis courts could be considered. Foley Stadium improvements are to provide better access and possible upgrades to playing fields. Beaver Brook Park is in a flood plain and possible installation of new underdrains to make the fields more usable would help. Park Ave site could possibly accommodate a new Stadium. This would require raised fields, water retention system and a 1,500-seat stadium with restrooms and lockers. Estimated budget $30-40 million plus land. Chandler site is under utilized and excavating into the existing hill could provide area for a baseball field and two flat grass practice fields. Estimated budget of $6 million.

Questions/ Answers: Katie said that all the off-site options would not be reimbursable by MSBA and funded as City improvements. She noted that these off-site upgrades are to enhance the options for the new school non-reimbursable and at this point very difficult to establish the MSBA reimbursement rate which is possibly 50/50 for on-site projects. Temporary off-site parking is also being reviewed and she opened the presentation for questions.

Questions from School Building Committee members:

- How much of the existing park land at Doherty will be used? Zero, no park land lost.
- Is there any legal way to ensure students remain at the existing school during construction? - No student relocation is planned. Contract documents will be clear.
- How is demolition and abatement handled? There is partial reimbursement by the MSBA for these.
- Is it possible to ask the Athletic Director questions regarding field usage?
- Can we consider a swimming pool? The MSBA does not allow this for their projects.
- Any options to widen Highland Street? We are looking at traffic impacts. Possible drop off area in front, but we cannot encroach on Park land at each end of the site.

Questions from General Public:

- Park was to be a Park and now is a school.
- 400 cars, what about the buses? Anticipate 8-10 buses for off street drop off.
- District athletics disrupted by Colleges. Schedules overlap and current arrangement is insufficient.
- Residents should make decisions not those living out of the City. School Building Committee has affiliation with the school and MSBA provides input on member requirements.
- Boys and Girls club in the City has a swimming pool.

- **Questions from General Public (continued):**
- Foley stadium is a shared facility and would need to be replaced. Project team was tasked to investigate the areas in the Doherty quadrant.
- How much parking is there at Doherty? Approximately 250 marked spaces, though there is much more actual cars on the site.
- The Doherty site is small and does not provide adequate fields. Is there a firm commitment from the City to move on some of the off-site schemes?
- No student parking on site during construction, they will need to walk to the off-site athletic fields.
- Where will the construction workers park? That is coordinated by the contractor.
- What is the cost to upgrade the fields behind Foley stadium? Will need to develop those costs.
- What is the visual impact on Park Street with the new school? Park Street is a lower elevation which will minimize the view.
- If new fields are at Chandler how will the schedule work for using them? Need to look closely at this issue if pursued.
- Is the building LEED? Yes it will be Silver at a minimum, also additional wall and roof insulation plus high efficient windows.
- What is happening on Dec 18th? The School Building Committee will vote on the Preferred solution. Then work will start on the Schematic design.
- How can we comment on the project? LPA has a website www.lpaa.com/get-in-touch where you can put comments.
- Is it possible to complete improvements to the Elm Park.

CLOSING:

Russ Adams thanked everyone for coming and the meeting ended at 8:00PM.

3.3.5 LOCAL ACTIONS AND APPROVAL CERTIFICATION

E. Press & Media Coverage

telegram.com
WORCESTER, MASSACHUSETTS

5 site options advanced for new Doherty High in Worcester

By Scott O'Connell

Telegram & Gazette Staff

Posted Sep 9, 2019 at 9:46 PM

WORCESTER - The building committee overseeing the upcoming update of Doherty Memorial High School unanimously opted to go forward with five construction options for further study in a much anticipated vote at the school Monday evening.

Those options include the three required by the state's school building authority, which is poised to fund a large portion of the project: a code upgrade of the current high school, more extensive renovations of the building, and a full rebuild at the existing Highland Street site.

In addition, the consultants who have been working on the feasibility study for the project have recommended two potential relocation options: one that would send Doherty to the current Foley Stadium site on Chandler Street, and another that would have the new high school replace the existing Chandler Magnet School farther north on Chandler Street, across from Worcester State University.

That final option would require the city to purchase a small portion of land bordering the Chandler Magnet site owned by a university foundation. The project planners on Monday night threw out a previous version of that plan that would have attempted to fit the school on the existing city-owned land.

Under the plan approved by the Doherty building committee, the city's consultant, Lamoureux Pagano Associates, and Worcester officials would continue to study those five options with the aim of choosing a final "preferred solution" in December to submit to the school building authority.

If approved, that recommendation would lead to the development of a detailed design for the next Doherty, and finally construction, with the tentative goal to open the new school in the fall of 2024.

Lamoureux Pagano President Katie Crockett said all five options have drawbacks, and the decision on Monday night to continue studying them, rather than narrow down the list, will give project planners more time to investigate them.

“Our intent is to take a really deep look at how the program could fit in a site that we know is undersized,” she said, alluding to the realization during the feasibility study that Worcester doesn’t have a location for Doherty that completely provides the space needed for it.

At Monday night’s meeting, which drew hundreds of parents and other residents to the current Doherty’s cafeteria, there was still skepticism toward the plan so far, particularly the idea of getting rid of Chandler Magnet to support the new high school. Project planners have said Chandler Magnet’s students and special programs – the school is home to a dual language program – would be transferred to other schools in the city as part of that option, but several parents opposed the plan.

City Councilor Morris Bergman, who also sits on the building committee, wondered how the city could develop a plan at the Chandler Magnet site without actually owning the needed land. Worcester State and its foundation indicated two weeks ago the properties in question are not for sale.

“It seems kind of odd, we’re putting something forward with land we don’t even own yet ... we don’t know if we’ll ever own it,” he said.

Some parents also questioned the size projections for the new Doherty, which would be 420,000 square feet – around double the current school’s size – and cast doubt on projections that the local student population would increase enough to necessitate those dimensions.

Costwise, there would be little difference among the three rebuild options, according to projections shared at Monday's meeting: Building at the current site would come in between $302 million and $305 million, it would cost between $300 million and $302 million to build at the Foley site, and the relocation to Chandler Magnet would cost between $277 million and $280 million, although those last two estimates don't include required land acquisition.

The code upgrade and renovation options would cost $101 million to $104 million and $287 million to $290 million respectively, but project planners have focused more on the rebuild options, based on the limitations of the existing school building and site.

If the project does advance as a full rebuild, those cost estimates would eclipse the cost of the city's current major school building project, the replacement of South High Community School, which is coming in at $209 million.

LOCAL | B1

FIRST AID FOR FOUR PAWS

Pet emergency/CPR course offered in Uxbridge

SPORTS | C1

REBOUND SEASON FOR STEPHENSON

WPI junior leading Engineers in points, rebounds on court after last season's injury

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Woman fatally shot on Oread St.

Suspect captured, charged with manslaughter

By George Barnes
Telegram & Gazette Staff

WORCESTER - A 21-year-old woman was shot dead Tuesday morning on Oread Street and a 37-year-old man was arrested on a manslaughter charge, police said.

Police identified the victim as Suheill Ortiz.

Djarflo Irving, 37, was captured after police were granted an arrest warrant charging him with manslaughter in connection with the death, as well as carrying a firearm without a license and unlawful possession of ammunition, Worcester police said. The police report in Central District Court indicated the woman was shot once in the chest, Sgt. Sean Murtha said.

Police officers found the victim about 1:15 a.m. Tuesday in an apartment at 15 Oread St. She was suffering from a gunshot wound and was rushed to a hospital, where she was pronounced dead, police said.

Scanner transmissions indicated the woman's sister called police and told them Ortiz, who was pregnant, had been shot inside an apartment.

Police went to the address, found the victim and performed CPR on her before an ambulance arrived.

During the morning, police investigators were seen bringing what appeared to be bags of evidence out of the brick, two-story Victorian apartment building.

Pamela Williams, who lives across Oread Street from the building where the shooting took place, said she woke up when police arrived and saw police cars filling the street. Officers could be

See SHOOTING, A5

Worcester police crime scene investigators leave 15 Oread St. Tuesday morning. [T&G STAFF/ RICK CINCLAIR]

Left 'with no choice'

Democrats unveil impeachment charges against Trump

By Lisa Mascaro and Mary Clare Jalonick
The Associated Press

WASHINGTON — House Democrats announced two articles of impeachment against President Donald Trump on Tuesday, declaring he "betrayed the nation" with his actions toward Ukraine as they pushed toward historic proceedings that are certain to help define his presidency and shape the 2020 election.

The specific charges aimed at removing the 45th president of the U.S.: Abuse of power and obstruction of Congress.

Speaker Nancy Pelosi, flanked by the chairmen of impeachment inquiry committees at the U.S. Capitol, said they were upholding their solemn oath to defend the Constitution. Trump responded angrily on Twitter: "WITCH HUNT!"

Voting is expected in a matter of days by the Judiciary Committee, which begins deliberations Wednesday, and by Christmas in the full House. The charges, if approved, would then be sent to the Senate, where the Republican majority would be unlikely to convict Trump, but not without a potentially bitter trial just as voters in Iowa and other early presidential primary states begin making their choices.

In the formal articles announced Tuesday, the Democrats said Trump enlisted a foreign power in "corrupting" the U.S. election process and endangered national security by asking Ukraine to investigate his political rivals, including Democrat Joe Biden, while withholding U.S. military aid as leverage.

See IMPEACH, A3

From left, Speaker of the House Nancy Pelosi, D-Calif., House Financial Services Committee Chairwoman Maxine Waters, D-Calif., House Judiciary Committee Chairman Jerrold Nadler, D-N.Y., House Committee on Oversight and Reform Chair Carolyn Maloney, D-N.Y., House Ways and Means Committee Chairman Richard Neal, D-Mass., and House Intelligence Committee Chairman Adam Schiff, D-Calif., announce they are pushing ahead with two articles of impeachment against President Donald Trump Tuesday at the Capitol in Washington. [THE ASSOCIATED PRESS]

Goodbye, Columbus? Not in Worcester

City Council approves petition to retain holiday

By Nick Kotsopoulos
Telegram & Gazette Staff

WORCESTER - Columbus Day is going to remain a holiday in the city, celebrated on the second Monday in October as it always has been.

The City Council Tuesday night unanimously voted to reaffirm the city's commitment and participation in the celebration of Columbus Day as a holiday, six weeks after it had been asked by a resident to abolish Columbus Day and replace it with Indigenous Peoples' Day.

Maria Stella Fiore of 24 Amanola Ave. petitioned the council, asking it keep the Columbus Day holiday as it is. She said she filed the petition on behalf of the entire Italian American community in Worcester.

Speaking in support of the petition, Carmelita Bello of 4 Cheyenne Road said Columbus Day is a national and state holiday and has come to epitomize the contributions of all those of Italian heritage and descent.

See COUNCIL, A5

Vote on new Doherty site up next week

Building next to Highland St. school could run close to $300M

By Scott O'Connell
Telegram & Gazette Staff

WORCESTER – A local committee is set to decide at a meeting next week where to put the city's new Doherty Memorial High School, with the front-runner being a plan to keep the building at its current location.

At a meeting Monday, architects and city officials working on the project reiterated their stance that keeping the school at its current site on Highland Street remains the best of a relatively unideal set of options. That plan would also be the most expensive building, coming in at an estimated $292 million to $294 million project budget.

The next best option, at a projected $266 million to $269 million cost, would be to move Doherty to the current site of the city's Chandler Magnet School, whose students would have to be dispersed to make way for the project. That approach would also require the city to purchase abutting land to fit the new high school.

See DOHERTY, A4

Doherty Memorial High School in Worcester. [FILE PHOTO/MATT WRIGHT]

NEWS | A3

WELCOME TO 'TOP 4,' RICKY DURAN

Grafton native advances to finals in 'The Voice'

Home delivery: 800-922-8200
News tips: 508-793-9245 or newstips@telegram.com

TODAY	THURSDAY	FRIDAY
Morning snow	*Sunny; cold*	*Not as cold*
30° / 16°	*28° / 20°*	*39° / 36°*

Bloomberg at climate talks: Count on US

Candidate vows UN to rejoin Paris accord if elected

By Frank Jordans and Aritz Parra
The Associated Press

MADRID — New York billionaire and presidential candidate Michael Bloomberg led a high-powered charge against President Donald Trump's climate policies Tuesday, assuring activists, scientists and politicians from around the world that Americans are committed to reducing greenhouse gas emissions "even with a climate change denier in the White House."

Bloomberg, who launched his 2020 campaign less than three weeks ago, spoke during a trip to the U.N. global climate conference in Madrid, even as the official U.S. delegation at a booth nearby kept a low profile.

Together with former Secretary of State John Kerry and former Vice President Al Gore, Bloomberg constituted a sort of shadow delegation at a time when Trump is moving to pull the United States out of the 2015 Paris climate accord.

As other Democratic candidates have done, Bloomberg vowed to immediately rejoin the pact if elected president.

"The first thing you do, Day One, is you say we're going back in," he said. "That's a no-brainer."

The former New York mayor has helped support and fund a private push to get U.S. states, cities and businesses to abide by the terms of the Paris accord.

He touted a report that said nonfederal actors representing more than two-thirds of the U.S. economy are on course to cut the nation's emissions 37% by 2030 compared with 2005 levels. If the next administration joins in, that figure could rise to 49%, bringing the U.S. roughly in line with the Paris treaty, according to the report.

"Americans are willing to continue to work, even with a climate change denier in the White House," the 77-year-old businessman told a packed room.

The U.S. remains a party to the climate pact until Nov. 4, 2020 — the day after the U.S. presidential election.

Bloomberg, who has made climate change a central pillar of his bid for the nomination, also called for an end to U.S. subsidies and tax breaks for fossil fuels, which are one of the main sources of greenhouse gases.

Scientists say their use needs to end by the middle of the century if average temperatures on Earth are to rise no more than 1.5 degrees Celsius (2.7 degrees Fahrenheit) by 2100, the target set in the Paris agreement.

By taking aim at fossil fuel subsidies, Bloomberg is challenging both a powerful American industry and Trump, who has championed the extraction of oil, gas and coal.

According to a report by the International Monetary Fund, fossil fuel subsidies in the U.S. amounted to $649 billion in 2015. Only China spent more tax money — $1.4 trillion — to keep fossil fuel prices low that year.

The IMF report calculated that if prices for fossil fuels reflected their true cost, including the environmental damage they cause, consumption would drop so much that global carbon emissions would be 28% lower.

Bloomberg has long been an advocate of international efforts to curb global warming and until recently was the U.N.'s envoy for climate action. After the Trump administration stopped paying U.S. dues to the global body's climate office, Bloomberg's philanthropic organization stepped in to foot the bill. But his attendance at this year's summit stands out because of his presidential ambitions.

The Trump administration sent a low-level delegation to the talks, led by a career diplomat, Marcia Bernicat, former U.S. ambassador to Bangladesh.

Other prominent Americans attending the 12-day conference include Gore and Kerry, who said the absence of any high-profile representative from the White House at the talks "speaks for itself."

"It's an absence of leadership," Kerry said. "It's a tragedy."

Kerry, who as America's top diplomat at the time was key to negotiating the Paris accord, called on citizens to hold business and political leaders accountable in the fight against climate change.

Germany's environment minister, Svenja Schulze, welcomed the presence of rival American delegations.

Democratic presidential contender Michael Bloomberg gives a speech at the US Climate action center during the COP25 summit Tuesday in Madrid. [THE ASSOCIATED PRESS]

"We should keep showing that it's not just Trump, but that there is a lot happening in the United States on the issue of emissions reduction and climate action," she said.

One climate policy expert questioned the narrow focus of Bloomberg's report, however.

"The Paris agreement isn't only about reducing emissions," said Kevin M. Adams, a research fellow at the Stockholm Environment Institute. "It is also about managing the risks of living in a warming world, including the impacts we are already experiencing today, and providing finance to developing countries who have contributed so little to the problem but will be affected first and worst by climate change."

The talks in Madrid shifted into higher gear Tuesday as ministers arrived to tackle some of the thorny political issues still on the table.

Despite growing awareness of climate change and warnings from scientists that drastic action is needed, only a few countries sent their prime ministers or presidents to negotiate, worrying some observers.

"It shows that there has not yet been an internalization of the emergency situation that we are in, that so few heads of state are coming to Madrid and ready to roll up their sleeves and do what it takes to actually respond to the science," said Jennifer Morgan, executive director of Greenpeace International.

Environmental activists are hoping the European Union will present an ambitious plan Wednesday on cutting emissions that will send a message of hope. Climate change has become a growing political issue in Europe, with mass protests by young people such as Swedish activist Greta Thunberg, who is delivering a speech at the U.N. gathering on Wednesday.

American actor Harrison Ford said it is time to listen to those "who will inherit what we have wrought."

"Their future has already been diminished by our past," he said at an event alongside Bloomberg.

DOHERTY

From Page A1

The third and lowest-graded proposal is to relocate the high school to the Foley Stadium site on Chandler Street, which would cost $286 million to $289 million. Compared to the other options, however, that plan would carry much more additional cost to the city – $50 million to $60 million, as opposed to $6 million to $12 million for the other two proposals – and would eliminate a valuable recreational resource for the city.

The building committee overseeing the planning process for the new school is scheduled to pick from those choices at a meeting on Dec. 18. Their selection will then be submitted for approval to the state's School Building Authority, which is on-board to fund the majority of the project cost.

The new high school is tentatively slated to be ready to open by the fall of 2024.

"I think it will be an unbelievable school," said Superintendent Maureen Binienda. A member on the building committee, Binienda agreed with the idea of staying on Highland Street. "I think it's the best solution, although I'm only one vote."

The placement of Doherty has been the main sticking point so far in the early planning process for the new school, with various groups raising concerns about each of the proposals. Advocates for Elm Park, for instance, have sought assurance the project will not encroach onto the Newton Hill section of the park, which is right next to the school.

Parents with children at Chandler Magnet, meanwhile, have opposed the plan to tear down their school and break up its students, who would have to be sent to separate schools. Binienda said a recent study of the district's options determined the elementary school's population, which is part of a special bilingual program at the school, could not be all moved to another building in the city.

Getting rid of Foley Stadium would also create a "monumental task" on top of building the high school itself, said K. Russell Adams, assistant commissioner of the city's Department of Public Works & Parks, since the city would have to quickly find an alternative facility to replace Foley, which the city schools depend upon as a primary athletic field.

"In a nutshell, in all three (options) we can build a building that meets the educational program" needs of the envisioned new Doherty, he said, but sticking at Highland Street presents the least impactful downsides.

If approved by the MSBA following next week's vote, the project would then move into the schematic design phase. In that stage, city officials and architects working on the undertaking would flesh out the design of the new school.

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