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.

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**

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.

<u>Access Improvements</u>

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 athletic field, roadways and parking.

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.