

PROJECT MANUAL

East Longmeadow High School

Design Development Submittal

Town of East Longmeadow

180 Maple St,

East Longmeadow, MA 01028

March 29, 2024

OWNER

Town of East Longmeadow

60 Center Square

East Longmeadow, MA 01028

SUBMITTED BY

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In association with:

SMMA

1000 Massachusetts Avenue

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JWA No. 2206

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EAST LONGMEADOW HIGH SCHOOL

10 PROJECT DESCRIPTION

1010 Project Summary

1010.10 Summary of Work

Project is the construction of a new High School, grades 9-12, located in East Longmeadow, Massachusetts. The project includes construction of a new school building, with classrooms, gymnasium, and 533- seat theater; and outdoor athletic facilities including assorted sports fields, tennis courts, press box and a concessions building. Construction is expected to begin August 2024 and extend 36 months.

1010.30 Trade Contract Summaries

The Project will include the following Trade Sub-Bid categories and related Specification Sections.

Masonry Trade Sub Bid

Miscellaneous and Ornamental Iron Trade Sub Bid

Waterproofing, Dampproofing and Caulking Trade Sub Bid

Roofing and Flashing Trade Sub Bid

Glass and Glazing Trade Sub Bid

Metal Windows Trade Sub Bid

Tiling Trade Sub Bid

Terrazzo Stair Finish Trade Sub Bid

Acoustical Ceilings Sub Bid

Resilient Flooring Sub Bid

Painting Trade Sub Bid

Elevator Trade Sub Bid

Fire Protection Trade Sub Bid

Plumbing Trade Sub Bid

HVAC Trade Sub Bid

1010.50 Work Restrictions

Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.

On-Site Work Hours: Limit work to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, except as otherwise indicated. Obtain prior authorization from the Owner at least 72 hours in advance for work at the site outside these hours or on weekends. Schedule deliveries of material and equipment to the site during normal hours of construction operations, however without impeding the normal school operations. School arrival and departure times are approximately 7:05 a.m. to 7:25 a.m. and 1:45 p.m. to 2:05 p.m.

Restriction on work within the building: Work shall only be performed within the phased work areas, only after all temporary noise and dust barriers have been constructed and temporary exhaust fans made operational.

Restrictions on Use of Site: Site Work and Work outside the building may be performed while school is in session if it does not interfere with or impede school activities, including but not limited to arrivals and departures of students and staff, and outdoor athletic and play activities.

Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner without prior written approval of the Owner.

Noise, Vibration, and Odors: Coordinate operations that may result in elevated levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner. The Owner will be the sole judge of whether construction activities are disrupting operations.

Quiet Days: Each phase will include five quiet days, to be chosen by the Owner. During these days no work will be performed, that in the judgment of the Owner, will impact their activities during these days.

Employee Screening: Comply with Owner's requirements regarding CORI reporting and requirements stated in the General Conditions regarding CORI screening of Contractor personnel working on the Project site.

Identification Badges: Provide identification badges for Contractor's employees, and for employees of the Contractor's subcontractors, sub-subcontractors, and suppliers.

No Smoking On Site: Smoking, tobacco products, e-cigarettes, and other controlled substances are not permitted on the project site.

1010.51 Proprietary Items

The Building Committee has voted to agree to the following proprietary items which they have deemed to be in the best interest of the Town as an extension of existing systems:

- BMS: StruxureWare
- Door Access: AXIS
- Hardware: Schlage

- Security Cameras: AXIS
- Clocks/Paging: Atlas
- Video surveillance: AXIS
- Theatrical Lighting Controls :ETC

1020 Project Program

1020.10 Site Program

Access roads, parking areas for students, staff, and visitors, parent & bus drop-off loops, emergency vehicle access around building, and truck access to the loading dock.

Outdoor dining area, (2) outdoor classrooms and space for clients' passive recreation and an outdoor athletics programming including, (2) basketball courts, (6) tennis courts, (2) baseball fields, (2) softball fields, (4) multi-purpose sport fields, new concessions building, new access ramp to new press box and a small Pre-K Play Area.

Exterior building-mounted cameras and lighting.

1020.50 Facility Program

The new building will be constructed as a two-story, 191,796 GSF facility with classrooms, a gymnasium, cafeteria/commons, a 498-seat auditorium, and associated spaces. The building will accommodate the Town's IT Department, District Offices, and ELCAT (East Longmeadow Community Access TV). The existing school will be completely demolished after the new facility is occupied.

1030 Project Criteria

1030.10 Zoning Requirements

The building will be designed in accordance with local zoning bylaws.

1030.20 Code Analysis

The building will be designed in accordance with the Massachusetts State Building Code, 10th Edition and all referenced standards, the Massachusetts Stretch Energy Code, the Massachusetts Architectural Access Board (MAAB) and the Americans with Disabilities Act (ADA) accessibility standards.

East Longmeadow is a Stretch Code Community. The East Longmeadow High School project will be permitted under the new 2023 Massachusetts (MA) Energy Code and Stretch Code International Energy Conservation Code 2021 (IECC 2021), including the new Massachusetts amendments and new Stretch Code requirements that were issued in 2023.

1030.50 Sustainable Design Requirements

LEEDv4 Certification: Leadership in Energy and Environmental Design (LEED); LEEDv4 Certification: The awarding authority has determined that this facility shall be designed and constructed in accordance with the principals of the U.S. Green Building Council's LEED Green Building Rating System™, in order to achieve LEED Silver Certification.

It will be necessary for East Longmeadow School District to register the project with USGBC Design, material and systems selections consistent with the Silver Certification goal.

Schools criteria, and the additional options that may be exercised in order for this building to achieve a Silver Certification. All of the criteria identified as "prerequisites" must be met to achieve certification. Between 50 and 59 LEED points are required for Silver Certification.

During subsequent design development, contract document, and construction phases, the opportunities and decisions presented in the matrix will be developed further and formally documented.

Containment of work areas during abatement and demolition of the existing building will be essential to protect occupants of the new school occupied during the duration of demolition.

Once the project is complete, a commitment to recycling, green housekeeping and parking practices is included within the project.

The SBC voted in August 2023 to pursue 3% additional reimbursement available to projects that meet the requirements of the 2023 MA DOER Stretch Code and the 2023 MA DOER "Specialized Code" and the additional 1% reimbursement based on the goal of achieving 5 of 7 LEED indoor air quality points. The project will be designed to meet the additional requirement to the MA Specialized Code through the Net Zero Schools compliance pathway of the Specialized Code.

Refer to the appendix DD for the LEEDv4 Scorecard and the Sustainable Design Requirements.

1030.56 Indoor Air Quality Requirements

The new facility will have specification requirements to ensure that air quality at the new building is not impacted by demolition activities of the existing building that lead to unhealthy or uncomfortable conditions for students, staff, faculty, visitors, as well as construction personnel.

Demolition and Abatement: The Contractor is required to employ a Certified Indoor Environmentalist (CIE) as a qualified IAQ Consultant to prepare IAQ plans, monitor air quality, interpret sampling results, evaluate materials used during construction, and recommend changes to mitigate unacceptable air quality. The CIE will make recommendations regarding work practices, conduct indoor air quality testing, and review the properties of construction materials based on MSDS sheets to ensure that air quality in the occupied spaces of the building meets regulated and guideline recommendations. Work areas will be maintained under negative pressure, relative to adjacent occupied areas, at all times during construction, by means of appropriately sized and correctly functioning fan units directly exhausting thru filtration to the outside of the building and dust and soundproof partitioning.

1040 Existing Conditions

1040.30 Assessment

The East Longmeadow High School is located at 180 Maple Street in East Longmeadow Massachusetts. The property is bounded by Maple Street and residential properties to the North, Saint Michael's Parish, the Redstone Rail Trail, and retail establishments to the east, industrial and residential properties to the south, and residential properties to the west. The property is approximately 61.4 acres and is identified by the Town of East Longmeadow Assessor as Parcel 17-33-10 (the Site). The Site is accessed from three (3) curb cuts along Maple Street and a singular point from Norden Street. Approximately 20 feet of grade change exists across the site and generally slopes down from north to south. The higher elevations are along Maple Street and

the lower elevations are in the southern and eastern portions of the site. The existing school sits approximately 10 feet below the front access point elevation on Maple Street.

The northern half of the Site contains the school building, the front U-shape access drive and main parking lot off of Maple Street, the access and parking off of Norden Street, pedestrian walkways, tennis courts, the track with synthetic field, a practice field, and areas of open green space. The primary service area is located on the south façade of the building. The track and field area contains two (2) spectator stand areas, a press box, two (2) concession buildings, a ticket booth building, and dedicated stadium lighting.

The southern half of the Site consists of various turf grass athletic fields, two baseball diamonds, one tee ball diamond, a stormwater pond, and wooded areas.

1040.50 Subsurface Investigation

Various subsurface investigations have been performed and include soil probes, soil borings, test pits, and a geophysical survey.

Subsurface soils have been evaluated to confirm geotechnical recommendations for the building foundations and earthwork. Soils have also been analyzed to confirm restrictions when exported from the site.

1050 Owner's Work

FF&E: Owner will provide moveable furniture, fixtures and equipment under a separate contract.

Technology Equipment: Owner will provide instructional technology equipment under a separate contract. Infrastructure and coordination will be under the construction contract.

1090 Funding

1090.10 Budget

Estimated total project cost is \$177,460,645

1090.30 Sources

The project is funded by way of debt exclusion bond measure by the Town of East Longmeadow and a grant of the MSBA with Mass Save and other sustainability incentives providing support for renewable energy and energy conservation systems.

20 OWNER DEVELOPMENT

2020 Permits

2020.10 Zoning Permits

Site Plan Review through the Town of East Longmeadow Planning Board will be required for this project. A Special Permit for earth removal operations is required through the Town of East Longmeadow Planning Board.

2020.30 Building Permits

A building permit will be applied for by the General Contractor.

2020.50 Regulatory Required Permits

See General section Z70.

30 PROCUREMENT REQUIREMENTS

3010 Project Delivery

3010.10 Project Delivery Methods

The Project will employ a construction management at risk delivery method, as permitted under M.G.L. Ch. 149A, as promulgated by Chapter 193 of the Acts of 2004, subject to issuance of a notice to proceed by the office of the inspector general.

Qualifications Requirements: Bidders bidding on the General Contract will be required to be certified by DCAMM.

Trade Contractors: will be required to meet qualification criteria which will be written into the Specifications by the Architect. Generally, qualifications will include minimum years of experience and experience on other projects of similar size.

3020 Solicitation

3020.10 Advertisements and Invitations

Bid Solicitation: The Project will be advertised and bid in accordance with M.G.L. Chapter 30 and M.G.L. Chapter 149A, Section 44, the statutes governing bidding for public works projects in Massachusetts.

Bid security: in the form of a bid bond or a treasurer's or cashier's check will be required.

Any requirements which the Town of East Longmeadow may have with respect to promoting equal employment opportunity and affirmative action, or to encouraging the participation of minority-owned business enterprises and women-owned business enterprises will be made a part of the bidding requirements and the conditions of the Contract.

Geotechnical Information: Boring logs and Test Pits obtained by the Owner for use by the Architect in developing the design will be made available to bidders. Refer to the 12/19/2022 Preliminary Geotech Report and the 3/27/23 Limited Subsurface Report and the Permeability and Field-Testing Reports dated 5/26/22 and and February 2024 Geotech Report provided by O'Reilly, Talbot and Okun.

3040 Available Project Information

3040.30 Existing Condition Information

Existing building and site plans are available and will be provided to the cost estimators. There is no guarantee that these drawings represent as-built or current building conditions.

40 CONTRACTING REQUIREMENTS

4010 Contracting Forms and Supplements

4010.30 Agreement Forms

The successful Construction Manager and Trade Contract-bidders will be required to comply with the Town of East Longmeadow's Equal Employment Opportunity and Affirmative Action (EEO/AA) policies and the MSBA's Minority Business Enterprise/Women-owned Business Enterprise (MBE/WBE) requirements.

The form of agreement between the Owner and the Contractor will be AIA Document A101-2007.

The General Conditions of the Contract will be AIA Document A201-2007, modified to reflect the specific requirements of this Project.

Form of Owner-Contractor Agreement: AIA A101-2007, Stipulated Sum.

Form of General Conditions: AIA A201-2007, with amendments.

Amendments will be drafted by JWA, reviewed by the Town of East Longmeadow's counsel and the Town's insurer. Statutory provisions applicable to the construction of public buildings in Massachusetts will be included.

Trade Contracts: Contracts between the Construction Manager and the Trade Contractors for filed sub-bid trades will be in the form set forth in M.G.L. Ch. 149, s.44F.

Bonds: The Construction Manager/Contractor and Trade Contractors will be required to furnish Performance and Payment Bonds in the full amount of the Contract Price.

Insurance: requirements for types and limits of insurance coverage which the Contractor shall be required to carry will comply with MSBA requirements.

4030 Conditions of the Contract

4030.30 General Conditions

The General Conditions of the Contract will be AIA Document A201-1987, modified by statutory requirements applicable to public work in Massachusetts, and by such other terms and conditions as the Town's attorney and the Town's insurance advisor shall require.

4030.35 Supplementary Conditions

The project team will draft additional Supplementary Conditions for review by the Owner and the Owner's attorney, based in information which the Owner will provide.

Town of East Longmeadow requirements for types and limits of insurance coverage which the Contractor is to carry.

Town of East Longmeadow has a policy of equal employment opportunity (EEO) or affirmative action (AA), or a policy/program governing the employment of minority-owned businesses or women-owned businesses.

A. SUBSTRUCTURE

A10 FOUNDATIONS

A1010 Standard Foundations

A1010.10 Wall Foundations

20" thick reinforced, cast-in-place concrete walls with an 8" brick shelf resting on continuous strip footings, around the perimeter of the building, extending at least 4'-0" below finished grade for footings resting on compacted structural fill or undisturbed soils. Concrete that is used for the cast-in-place concrete walls to use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

A1010.30 Column Foundations

Individual spread footings at columns with allowable bearing pressures as recommended in the Site Geotechnical Evaluation Report. Concrete that is used for the spread footings to use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

A1020 Special Foundations

A1020.80 Grade Beams

Strap concrete grade beams between some column footings will be required to resist uplift at locations of steel braced frames. Concrete that is used for the grade beams to use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

A40 SLABS-ON-GRADE

A4010 Standard Slabs-on-Grade

A4010.10 Standard Slabs-on-Grade

Cast-in-place concrete slab 5" thick, reinforced with welded wire fabric, placed over insulation and a vapor barrier and a base course of approximately 8" of compacted gravel. The floor of the auditorium will be constructed as an inclined slab on grade, with 5" thick reinforced concrete. The exact details of the slab-on-grade subgrade

preparation will be determined from the recommendations set forth in the Geotechnical Site Evaluation Report. Concrete that is used for the slabs on grade to use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

See Section G1030, Sitework Excavation, for requirements for excavation including rock excavation, backfilling and compacting.

A4040 Pits and Bases

Elevator Pits: Constructed with 12" reinforced concrete walls with a 12" thick reinforced concrete foundation mat incorporating a sump pit as required. An appropriate waterstop will be part of the design. Concrete that is used for the elevator pit to use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

Kitchen Pits: Typical service pits and trenches will be comprised of 4000psi reinforced concrete pits comprised of 8" thick walls and 8" thick foundation mat. Concrete that is used for the concrete pits to use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

A4090 Slab-On-Grade Supplementary Components

A4090.10 Perimeter Insulation, Slab Insulation, and Vapor Retarder

Perimeter Insulation: 4" thick foamed plastic insulation, continuous with the under-slab insulation, extending vertically along the outside face of foundation walls for a distance of 4'-0" below finish grade.

Under-Slab Insulation: 2" thick foamed plastic insulation, extending under the entire surface of the floor slab with 4" for a 6' wide area around the perimeter.

A4090.20 Vapor Retarder

Vapor Retarder: Heavy-duty, unreinforced, 15 mils thick polyolefin sheet with Perm Rating of 0.03 perms or less, "Stego Wrap" by Stego Industries, LLC, or equal; continuous under the slab on grade.

A4090.30 Waterproofing

Elevator Pits: Elevator and other pits will be made watertight by application of negative-side waterproofing. Product: crystalline waterproofing, Xypex, by Xypex chemical corporation or equal.

A4090.40 Dampproofing

Bituminous Dampproofing, cold applied, at foundation walls, footings, and frost walls, and drainage panels as a protection course

A90 SUBSTRUCTURE RELATED ACTIVITIES

A9010 Substructure Excavation

A9010.10 Backfill and Compaction

See Section G1070, Site Earthwork, for requirements for excavation including dewatering, backfilling, and compacting.

B. SHELL

B10 SUPERSTRUCTURE

B1010 Floor Construction

B1010.10 Floor Structural Frame

Structural Steel Recycled Content: All steel is to consist of a minimum of 95% recycled steel with over 80% post-consumer and 15% pre-consumer recycled material in compliance with LEED for Schools requirements.

Misc. Metals Recycled Content: Recycled content of Metal Products; Provide products with average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is no less than 60%.

Lateral Load-Resisting System: Lateral loads due to wind and seismic forces will be resisted by diagonal braced frames at selected locations, at each level and will be incorporated within the interior and/or exterior wall systems. The building will be subdivided by 1 or 2 expansion joints. Each of the sections will have its own lateral force resisting system.

B1010.20 Floor Decks, Slabs, and Toppings

Typical elevated floor construction will consist of a 3¼" lightweight concrete slab on 3", 18 gage composite metal deck, (6¼" total depth), reinforced with welded wire fabric. (This floor system provides a 2-hour fire rated floor slab without the need to spray fire-proof the deck). The slab will be supported on a system of composite, wide flange structural steel beams compositely connected to the slab with field welded shear connectors. Steel composite beams will be supported on composite steel wide flange girders. The steel girders will in turn be supported on steel wide-flange columns, round, or square tubular columns. Concrete that is used for the slab on deck to use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

Steel framing which is not concealed by walls or ceilings will be considered Architecturally Exposed Structural Steel.

A vibration analysis is typically performed on all framing members, in order to create a structure that is comfortable, and free from excessive vibrations that would create discomfort for the building's occupants.

Lateral Bracing for Seismic/Wind Loads: Steel braced frames consisting of 5" to 6" square diagonal steel tube members in a chevron or single diagonal configuration, located within the interior partitions or at strategic locations in the exterior walls.

The classroom wing will be Type IB construction with a 2-hour rating for floors, and a 2-hour rating for columns. The structural systems shall conform to Underwriters Lab or Factory Mutual specifications.

The structural system for assembly areas will be Type IB with a 2-hour rated floor assembly

B1010.50 Ramps

Exterior ramps will be constructed as cast-in-place concrete slab supported on concrete foundation walls and footings. Slab surface will receive a broomed finish.

Railings and Handrails: Exterior Galvanized steel pipe rail, painted guard rails with stainless steel handrails.

B1010.90 Floor Construction Supplementary Components

Floor Construction Fireproofing: Columns, girders and beams supporting floors (but not lateral bracing members) will be protected with sprayed-on fireproofing, with a 2-hour equivalent rating. Floor slab decks do not need fireproofing as their composite section with lightweight concrete provides the required rating.

Architecturally exposed columns away from curtain walls may be replaced with UL-certified 2 hour rated prefabricated structural steel columns composed of 4,000psi concrete and fireproofing material encased in steel. Basis of design is Fire-trol.

Architecturally exposed columns near curtain walls will be protected with intumescent paint fireproofing.

Floor Construction Firestopping: Through-penetration fire-stopping in accordance with a tested U.L. design, to attain a 2-hour F-rating, and a corresponding T-rating where required by Code.

Each Trade sub-contractor shall provide firestopping design and installation for all penetrations caused by that trade to the wall/floor/ceiling assemblies. The work of all trades and subcontractors will be referenced to a single firestopping specification and reference standards.

Low-emitting Materials: All fireproofing will be specified to meet the test standards of Indoor Advantage Gold, Greengard Children and Schools of California Department of Health Services "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using small- Scale environmental Chambers."

B1020 Roof Construction

B1020.10 Roof Structural Frame

Solar-ready per code, Massachusetts: Total solar-ready zone area shall consist of an area not less than 1,600 square feet, or 75% of the roof area that is either flat or oriented between 110 degrees and 270 degrees of true north, exclusive of mandatory access or set back areas. Solar-ready zones shall be free from obstructions from roof equipment or accessories.

Typical Classrooms wings, and Administration Wing: Roof Construction will consist of 3" deep, 18 gage type "B" galvanized metal roof deck. Roof Decks will be supported on a system of wide flange steel beams spaced 10' apart, maximum, and in turn will be supported on steel wide flange girders. The Girders in turn will be supported by steel pipe, square tube shaped, or wide flange columns carried to the foundation. Steel weights for these areas to be 9-10 psf. Roof will be sloped to roof drains at ¼ inch per foot. This will be achieved with tapered insulation.

Roof areas directly beneath the larger rooftop mechanical equipment as well as a 5' perimeter around the unit will be constructed with a 4" normal weight concrete topping slab supported on a 2" deep, 20 gage, galvanized composite metal deck, (6" total depth), supported on wide flange beams and girders. Roof will be sloped to roof drains at ¼ inch per foot. This will be achieved with tapered insulation.

All roof areas that are not designated for rooftop equipment or other purposes will be designed with a 20 PSF allowance for roof mounted photovoltaics. Areas to receive Photovoltaic panels will require an 18-gage deck, and an additional 1.0 PSF of steel framing.

Auditorium and Gymnasium: The roof framing will be 3" deep, 20/20gage, Type BCA, galvanized, cellular acoustic metal deck supported by wide flange steel beam, which in turn, will be supported by "LH" series long-span steel joists spaced a maximum of 8'-0" apart. The Gymnasium structural framing shall include design factors for support of gym divider partition and other hung equipment. The roof will be designed with a 20 PSF allowance for roof mounted photovoltaics. Roof will be sloped to roof drains at ¼ inch per foot. This will be achieved by sloping the steel.

Cafeteria Portions of high roof over the cafeteria shall consist of 3" deep, 20/20gage, Type BCA, galvanized, cellular acoustic metal deck supported on exposed glulam beams which are supported by perimeter steel beams. Roof will be sloped to roof drains at ¼ inch per foot. This will be achieved with tapered insulation.

Lobby and Media Center: Roof shall consist of 3" cellular acoustic, roof deck supported on glulam. Beams spaced a maximum of 9' apart. The joist will frame perimeter steel girders, supported on steel columns carried to the foundation and protected as required by code for IB construction. Roof will be sloped to roof drains at ¼ inch per foot. This will be achieved with tapered insulation.

Lateral Load-Resisting System: Lateral wind and seismic forces will be resisted by braced frames at selected locations and incorporated into interior and/or exterior wall systems.

B1020.20 Roof Decks, Slabs, and Sheathing

Areas of the roof supporting large mechanical equipment will be constructed with concrete topping applied to galvanized composite metal deck, supported on wide flange beams and girders for equipment mounting.

B1020.30 Canopy Construction

A steel framed roof with 1-1/2 inch galvanized metal deck supported on steel beams.

Lateral load-resistance will be provided by moment connections between the steel framing and structural columns.

B1020.90 Roof Construction Supplementary Components

Refer to paragraphs describing roofing membrane system.

Roof Construction Fireproofing: Steel beams, girders and columns supporting roof deck will be protected with spray-applied cementitious fireproofing to attain the fire ratings required by Code for Type IB protected construction. Roof Deck on Auditorium, Cafeteria, Gymnasium, Lobby and Media Center will not be fireproofed.

Roof Construction Firestopping: Through-penetration fire-stopping in accordance with a tested U.L. design, to attain a 1-hour F-rating, and a corresponding T-rating where required by Code.

Each Trade sub-contractor to provide firestopping design and installation for all penetrations caused by that trade to the roof assemblies. Work of all trades and sub-contractors will be referenced to a single firestopping specification and reference standards.

B1080 Stairs

B1080.10 Stair Construction

Exterior stairs: will be constructed as cast-in-place concrete slabs supported on concrete foundation walls and footings. Tread and landing surface will receive a broom finish.

Exterior Railings and Handrails: Galvanized steel pipe rail; painted.

Interior Stairs: Steel stairs conforming to NAAMM (National Association of Architectural Metal Manufacturers) "**Architectural**" **Class**, with structural steel stringers, concrete-filled steel pan treads and platforms, steel plate risers. At cafeteria B location (south stair) steel plated riser to be perforated metal.

Steel stairs conforming to NAAMM (National Association of Architectural Metal Manufacturers) "**Commercial**" **Class**; steel components shop primed and field painted with alkyd paint system.

Railings A: (Cafeteria A) Perforated metal panel guard rail, on metal frame, powder coated, with stainless steel guard rail and maple top rail cap, stainless steel handrail and rail mount.

Railings B: (Learning Stair and Academic Stairs and Egress Stairs) Flat stock metal balusters with 1/4" tensioned steel cable with maple top rail cap guard rail; stainless steel handrail and rail mount.

Railings C: (Auditorium) Flat stock metal baluster with cross rail and guard rail, maple top rail.

Railing D: (Learning Stair) Stainless steel handrail and mounts. [OBJ]

B1080.80 Ladders

Roof Ladders: Galvanized, painted steel.

B20 Exterior Vertical Enclosures

B2010 Exterior Walls

B2010.10 Exterior Wall Veneer

Unit Masonry, Clay Brick(S13): Brick Masonry, Standard size, running bond : Palmetto Brick company, Field Brick: Light Rose (25%), Dark Rose (25%), Caramel (50%) Standard 8" nominal brick or similar accented with contrasting Colors, Precast concrete trim and stone base, tied to stud framing with stainless steel, thermally improved ties. Precast concrete trim will be at window sills, and at transitions between brick and rainscreen assemblies. Loose steel lintels above openings less than 8'-0" wide. Through wall flashing to be composite stainless-steel fabric with stainless steel drip edge.

Clay Brick(S13C): Accent Brick Masonry, similar to (S13) with every fifth horizontal course recessed by 3/4".

Unit Masonry, Clay Brick(S13B): Brick Masonry, Standard size, running bond: : Palmetto Brick company, Chocolate, wirecut finish. Standard 8" nominal brick or similar, Precast concrete trim and stone base, tied to stud framing with stainless steel, thermally improved ties. Precast concrete trim will be at windowsills, and at transitions between brick and rainscreen assemblies. Loose steel lintels above openings less than 8'-0" wide. Through wall flashing to be composite stainless-steel fabric with stainless steel drip edge.

Formed Metal Rainscreen System (S14): Formed metal, Morin Pulse. or similar, installed on thermally separated sub-structure such as Smart CI pultruded fiberglass

tied to stud framing. Stainless steel through wall flashing. A variety of 4 Custom Colors will be used.

Composite Metal Wall Panel Rainscreen System at canopies fascia and roof monitors (S16): Composite metal panels, Alucobond or similar with NFPA-285 wall assembly compliant panel core, installed on thermally separated sub-structure such and Smart CI pultruded fiberglass sub framing tied to stud framing. Stainless-Steel Through wall flashing. Custom Color

Insulated CMU wall at Concessions stand: 10inches insulated CMU wall ground face

B2010.20 Exterior Wall Construction

Design Wind Loads for Exterior Walls For elements located within 10 feet of salient corners and for soffits, 36 pounds per square foot inward and outward.

For elements located more than 10 feet from salient corners, 25.2 psf acting inward and outward.

For framing elements, such as stud back-up and curtain wall framing, which are located more than 10 feet from salient corners and have a tributary area of 200 square feet or more, 17.0 psf acting inward and outward.

Stud framing, 16 gauge or heavier steel studs with G90 galvanizing, covered with 5/8-inch-thick glass-fiber-faced gypsum panel sheathing. 6" studs typ.

Stud framing will be designed to resist wind loads calculated for the Project, with deflection not to exceed 1/600 for stud framing alone without contribution of sheathing to stiffness. Refer to Appendix B for pertinent wind loads.

Design stud framing to resist wind loads specified below, with deflection not to exceed 1/600 for stud framing alone without contribution of sheathing to stiffness.

For elements of framing within 10 feet of salient corners, 36 pounds per square foot inward and outward.

For elements of framing located more than 10 feet from salient corners and having a tributary area of less than 200 square feet, 25.2 psf action inward and outward. [OBJ]

Cavity Wall Construction (S13): Face brick veneer, air space, nonflammable moisture resistant, 6" of water repellant mineral wool board insulation installed at the outside face of the sheet air barrier, foil faced, self-adhering vapor retarding, modified bituminous sheet air barrier over 5/8" glass mat gypsum wall sheathing, cold form metal studs with gypsum board at interior face. And 3 ½" mineral wool batt insulation between the studs. Loose steel lintels above doors, window, and louver openings. Stainless steel brick ties and flashing.

Rain screen Wall Construction (S14): Formed Metal facing, rainscreen assembly air space, 6" of non-flammable, water repellant, mineral wool board insulation, self-

adhering vapor retarding, modified bituminous sheet air barrier over 5/8" glass mat gypsum wall sheathing, cold form metal studs, 3 1/2" mineral wool batt insulation between the studs, with gypsum board at interior face. Stainless steel flashing.

Rain screen Wall Construction (S16): Metal composite panel facing, rainscreen assembly air space, 6" of non-flammable, water repellent, mineral wool board insulation, self-adhering vapor retarding, modified bituminous sheet air barrier over 5/8" glass mat gypsum wall sheathing, cold form metal studs with 3 1/2" mineral wool insulation between the studs, gypsum board at interior face. Stainless steel flashing.

Water Drainage: Composite stainless-steel fabric flashing for through wall flashing in masonry cavity walls with integral stainless steel drip edge at lintels and shelf angles. Mortar mesh in air space, and open head weeps with cellular plastic baffles.

Air Barrier /Vapor Retarder: Self Adhering, Foil faced, vapor-retarding membrane air barrier, modified bituminous, GCP Applied Technology; Perm-a-Barrier, Low Temperature Aluminum Wall Membrane or equal. Applied over exterior face of sheathing throughout the building, wherever walls are insulated.

1. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
2. Vapor Permeance: Maximum 0.1 perm; ASTM E 96/E 96M.

Insulation Below Grade: See foundation insulation in Part A.

Building Enclosure Commissioning (BE CX): The Project shall include Building enclosure Commissioning (BE CX), as part of the LEEDv4 enhanced commissioning credits and MSBA requirements. Commissioning will include whole building blower door testing per ASTM E3158 or E1827.

B2010.30 Exterior Wall Interior Skin

Typical: 5/8-inch-thick gypsum board, with joints taped and finished.

Cavity Walls: 5/8-inch-thick gypsum board, with joints taped and finished, applied over galvanized steel cold-form metal framing.

B2010.60 Equipment Screens

Perforated Formed metal panels mounted on galvanized structural steel back up framing. A variety of 4 Custom Colors will be used Morin Pulse or similar.

B2010.80 Exterior Expansion Control

At exterior walls provide preformed, foam joint seals manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb/cu.ft. and impregnated with a nondrying, water-repellant agent. Factory produce in pre-compressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field applied adhesive for bonding to substrates.

B2020 Exterior Windows

B2020.20 Exterior Windows

Aluminum Windows: Extruded aluminum, factory glazed fixed and operable awning windows, and Fixed windows. Windows have thermally broken frames to achieve U=0.295 min. on operable units and U=0.225 min. on fixed units. Units combined for larger openings include field-mulled extrusions with mating frames and gaskets.

Extruded aluminum, factory glazed fixed and operable windows.

Vision Glass: Insulating triple glazed glass units, 1-3/4" thick (1/4" glass, Low -e coating + 1/2" air space with Argon + 1/4" glass, low E coating + 1/2" air space + 1/4" glass).

B2020.30 Exterior Window Wall

Storefront, at interior vestibules: Extruded aluminum, stick-built storefront assembly; thermal break, equal to Kawneer "Trifab 451T" framing system or similar system by EFCO or Vistawall, with high-performance organic coating ("Kynar 500") in an architectural color. Glazed with 1" thick insulating glass, clear tempered glass with low-E coating on No. 2 surface.

Glazed Curtain Wall: Extruded aluminum curtain wall system, employing EFCO Xtherm 5500, Kawneer "1600 Wall," Vistawall "2600," or equivalent framing system by Wausau, outside glazed. Mullions 2-1/2-inch face width, by depth required to resist wind loads. Glazed with Vision or translucent glass. Refer to Exterior Elevations for locations. Glazed Curtain wall system to have thermally broken frames to achieve an assembly U-value of U=0.23 for the assembly.

Vision Glass: Insulating triple glazed glass units, 1-3/4" thick (1/4" glass, Low -e coating + 1/2" air space with Argon + 1/4" glass, low E coating + 1/2" air space + 1/4" glass). Triple glazed, Insulating glass units; with Argon gas and Low-E coating. Unit U-value 0.14 or better and SHGC of .32 or better.

Translucent Glass: Translucent Insulating triple glazed glass units, 1-3/4" thick (1/4" glass, Low -e coating + 1/2" aerogel fill + 1/4" glass, + 1/2" air space + 1/4" glass).

Spandrel Glass Insulating triple glazed glass units, 1-3/4" thick (1/4" glass, Low -e coating + 1/2" air space with Argon + 1/4" glass, low E coating + 1/2" air space + 1/4" glass)., with opaque ceramic frit on the No. 6 surface.

Building Enclosure Commissioning (BE Cx): The project shall include building enclosure commissioning (BE Cx), as part of the LEEDv4 enhanced commissioning credits and MSBA requirements.

B2050 Exterior Doors And Grilles

B2050.10 Exterior Entrance Doors

Aluminum entrance doors: Aluminum stile and rail entry doors with 3-1/2-inch-wide stile, to match glazed curtainwall with custom arrangement of intermediate mullions.

Glass: Insulating glass units, 1" thick (1/4" glass + 1/2" air space w/argon gas + 1/4" glass) with low-E coating, tempered safety glass. Units U-value (winter) of 0.23 minimum and SHGC of 0.32 or better.

Security Glazing: LTI Smart Glass, Inc.; School Guard Glass SG4 at select locations.

Hardware: Full height continuous hinge; exit device; offset tubular pulls; closers; select threshold; weather-stripping.

One leaf at each entrance will also be activated by a low-power power-assisted operating device, with push-plates located on both sides of the door.

Locking will be coordinated with the owner's security system for access control.

B2050.20 Exterior Utility Doors

Flush steel doors, insulated, Extra Heavy Duty (16-gauge steel face with steel stiffeners in core), fully insulated, fully welded, 14-gauge steel frames, G90 galvanized, shop-primed and field painted. R-value of 7 or better.

Hardware: Mortised lockset with lever handle; butt hinges; threshold

B2050.40 Exterior Special Function Doors

Overhead Coiling Doors: Insulated Aluminum Overhead Service Doors with Electric Door Operator: Standard duty, with emergency manual chain operation, obstruction-detection device, audible and visual signals.

B2050.70 Exterior Gates

Refer to Section G2060.20.

B2070 Exterior Louvers and Vents

B2070.10 Exterior Louvers

Aluminum Louvers: Fixed Aluminum Louvers. 45% free area with insect screens and blank off panels. CS Louvers A4097 or sim. 3- coat Kynar finish.

Carry allowance of \$65,000 for exterior louvers and vents required for mechanical equipment.

B2080 Exterior Wall Appurtenances

B2080.70 Exterior Fabrications

Exterior Aluminum sun control devices. Horizontal sun control devices are required at the windows of the southern elevation. Prefabricated Aluminum with fixed horizontal fins. Kynar 3 coat finish, custom color.

The horizontal aluminum sun control louvers at the southern facing Curtain wall of the cafeteria and Western facing Curtain walls at LGI as shown on elevations. Prefabricated, curtain wall supported with fixed horizontal fins. Kynar 3 coat finish, custom color.

B2080.80 Bird Control Devices

Low profile electric bird deterrent device by Nixalite of America, Bird Barrier America, or Hot Foot America.

B30 EXTERIOR HORIZONTAL ENCLOSURES

B3010 Roofing

B3010.50 Low-Slope Roofing

ERA-1: [00] Low slope membrane roof, 1 hour fire rated assembly, fully adhered high albedo PVC membrane roof.

ERA-1A: Same as ERA-1, but no fire rating required and with acoustic metal deck (above auditorium, Gymnasium, Cafeteria and media Center).

ERA-1B: Same as ERA-1, but with composite concrete deck for HVAC equipment noise mitigation. No spray fireproofing associated with this roofing assembly as the composite deck provides the required fire rating.

Fully Adhered PVC: Polyvinyl Chloride membrane system, Sarnafil or equal, applied over steel deck, and also to concrete-filled steel deck, and consisting of the following components:

1. Membrane: 60 mil thick, reinforced. Color: Light grey or white.
2. Cover Board: Glass-mat, water-resistant gypsum board; pre-primed "Dens-Deck" manufactured by Georgia-Pacific Corp. or approved equal, 1/2" thickness.
3. Insulation: Polyisocyanurate with glass mat facers; 8 1/2-inch average thickness. R-50
4. Substrate Board: 1/2" thick primed "Dens Deck".
5. Vapor Retarder: Reinforced polyethylene; Griffolyn type.
6. Walkway Pads: As required for access to roof-top mounted equipment.
7. Warranty: Total system warranty, 20 years.

Building Enclosure Commissioning (BE Cx): The project shall include building enclosure commissioning (BE Cx), as part of the LEEDv4 enhanced commissioning credits and MSBA requirements.

B3010.70 Canopy Roofing

Same as above unless noted otherwise in this section.

B3020 Roof Appurtenances

B3020.10 Roof Accessories

Brake formed metal roof edge fascia, 8 1/2" high.

B3020.30 Roof Specialties

Metal Copings: Formed aluminum, 0.050-inch thickness min. with factory mitered and continuously welded corners. Finish: Custom 3-coat fluoropolymer.

Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover with a continuous extruded-aluminum anchor bar with integral drip-edge cleat to engage fascia cover. Provide matching factory mitered and continuously welded corner units. Finish: Custom 3-coat fluoropolymer.

B3060 Horizontal Openings

B3060.10 Roof Windows and Skylights

Plastic Unit Skylights: Plastic Unit Skylights: Nanogel Insulated fixed skylights on prefabricated curb. EcoSky3, Aerogel Filled, High Performance Skylight, by Wasco Products, inc or similar Products by Carlsisle Sun Wels, Duro-Last Duro-Light EcoSky3, Kingspan, Ecofil. Quantity: 6

B3060.10 Roof Monitors

Roof Monitors geometry as shown in drawings. 3 sides clad in Composite metal panel (S16) listed above on B2010.20, North face glazed. With Windows as listed above on B2020.20

Glass: Insulating triple glazed glass units, 1-3/4" thick (1/4" glass, Low -e coating + 1/2" air space with Argon + 1/4" glass, low E coating + 1/2" air space + 1/4" glass)..

B3060.50 Vents and Hatches

Provide Smoke Hatches over stage. Provide high temperature fusible link actuator, manual operator from level of stage, and automatic reset of switch when closed from above. Provide safety net inside opening of 4x4 steel cargo netting secured to curb. Quantity: 4

B3080 Overhead Exterior Enclosures

B3080.20 Exterior Soffits

Canopy: See also "Facias" in "Exterior Wall Skin" paragraph. The underside of the canopy will be finished with Wood Look Metal Slats sim to exterior rated Armstrong Metal works classic, over glass mat sheathing and an air barrier. The area under the canopy will be illuminated with recessed lights.

C. INTERIORS

C10 INTERIOR CONSTRUCTION

Sustainable Materials: Building materials will be selected to optimize the use of sustainable materials, as defined by LEED V4 for Schools, for Recycled Content, Rapidly Renewable, Regional, Certified Wood, Materials Reuse, Environmental Product Declarations, and Health Product Declarations. Sustainable materials include recycled content materials, wood certified by the Forest Stewardship Council as sustainably harvested, and material salvaged from a prior use.

Indoor Air Quality (IAQ):

Where applicable, paints and coatings wet-applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.

All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, July 1, 2005, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168. Exterior applied adhesives, sealants, coatings, roofing, and waterproofing materials applied on site must meet the VOC limits of California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings, and South Coast Air Quality Management District (SCAQMD), Rule 1168, effective July 1, 2005.

Wood will be specified with no added urea-formaldehyde.

Low-emitting materials will also be specified in the following categories: Carpet and carpet adhesives; resilient flooring and associated adhesives; other flooring adhesives; composite wood and agrifiber products; furniture and furnishings; acoustical ceiling panels, wall coverings, insulation and gypsum.

C1010 Interior Partitions

C1010.10 Interior Fixed Partitions

Masonry: Concrete unit masonry construction will be used to enclose spaces that need high durability, such as the following locations:

- locker rooms
- mechanical room
- fire pump room
- elevator shaft and elevator machine room
- receiving area.

Construction: Normal-weight concrete masonry units, varying sizes as indicated, ASTM C270 Type S mortar, reinforced with vertical rebar and with horizontal truss-type

reinforcing in every other course. Partitions will run from the floor to the underside of steel floor or roof deck above and will be restrained from lateral movement at the top.

Typical Gypsum Board Partitions: 5/8 inch thick gypsum board on 0.0179 inch (25 gauge) steel studs, 6" -deep studs spaced 16 inches on center(typ). Screw gypsum board to studs. Specify low carbon gypsum.

Non-Rated|Non-acoustic Partitions: Extend to 6-inches above the ceiling.

Fire-Rated|Acoustic Partitions: Extend to underside of deck.

2-hour rated construction around elevator shafts, electrical, emergency electrical closets, main switchgear room and mechanical shafts

1-hour rated partitions at stairs, kitchen, loading dock area, between classrooms and corridors.

Schedule of Gypsum Board Locations:

Install interior gypsum board products in the following locations:

- (1) Type X: Walls and ceilings unless otherwise indicated.
- (2) Moisture- and Mold-Resistant Type: Walls and ceilings in restrooms, locker rooms, server, kitchen
- (3) Abuse-Resistant Type: Corridor walls where tile/wood wainscotting is indicated.
- (4) High-Impact Type: Gymnasium walls where gypsum board is indicated.

Install cementitious backer board in the following locations:

- a. Shower rooms, restrooms behind tile, behind large format porcelain wall tile, and decorative tile wall locations

Refer to Wall Types for additional detail.

Acoustical Partitions: Generally, at the locations listed below, new partitions will be constructed as sound-attenuating, with an STC of 45 or better, with acoustical insulation inside the wall and acoustical caulking at top and bottom of the partition:

- (1) Music, Chorus and ensemble rooms. STC 60
- (2) Video Production STC 60
- (3) Auditorium & Lighting STC 65
- (4) Administrative areas including Planning Rooms. STC 45
- (5) Classrooms and Resources Rooms STC 60
- (6) Toilet rooms. STC 45 or better
- (7) Media Center STC 45 or better
- (8) Conference Rooms STC45 or better
- (9) Lab and Studio Spaces STC 60

C1010.20 Interior Glazed Partitions

Vestibules: At primary entrances, if a vestibule is included in the design, the interior vestibule wall will be constructed of **aluminum storefront, without thermal break**. The same material as the frame, sidelights and transom of the entrance door surround at the exterior walls.

Security Glazing: LTI Smart Glass, Inc.; School Guard Glass SG4 at entry vestibule

C1010.90 Interior Partition Supplementary Components

Through-penetration firestopping in accordance with a tested U.L. design, to attain and f-rating equal to the rating of the partitions, and a corresponding T-rating where required by code.

Top-of-partitions firestopping at rated partitions and smoke barriers in accordance with a tested U.L. Design.

C1020 Interior Windows

C1020.20 Interior Fixed Windows

Hollow metal borrowed lites, with 16-gauge hollow metal frames, face welded, and factory primed for field finishing.

Glazing: 1/4"-thick, fully tempered clear glass, laminated.

Security Glazing: LTI Smart Glass, Inc.; School Guard Glass SG4 at designated locations

C1020.50 Interior Special Function Windows

Transaction windows

Security Glazing: LTI Smart Glass, Inc.; School Guard Glass SG4

C1030 Interior Doors

C1030.10 Interior Swinging Doors

Flush Wood Doors: Flush wood doors in steel frames will be specified for cross-corridor doors, classrooms and other teaching spaces, administrative offices, break rooms, toilet rooms, and for other doors in public areas.

Product: Flush wood doors, hardwood veneer face, WDMA Premium Grade 5-ply construction, natural finish, as manufactured by Algoma, Eggers, Marshfield, Mohawk or VT Industries. Pre fit doors to steel frames.

(1) Face Veneer: Select Natural Birch CL18 veneer, plain sliced.

(2) Finish: Factory finish to match AWI TR-6 conversion varnish.

Flush Steel Doors: Flush steel doors in steel frames will be specified for mechanical equipment rooms, electrical equipment rooms, fire pump room, receiving area, and similar service locations.

Product: ANSI 250.8 Level 2, "Heavy Duty" doors, with 0.042-inch thick (18 gauge) cold-rolled steel faces, seamless edges. Shop-primed and field painted.

Steel Frames: 0.053-inch thick (16 gauge) cold-rolled steel hollow-metal frames; corners mitered and welded. Furnish drywall and masonry profiles, as appropriate to construction in which doors will be set. Shop-primed and field painted.

Door Hardware: Heavy-commercial quality; US 32D satin stainless finish.

- * Locksets: Mortised locksets and latchsets, with lever handles.
- * Keying: Grand-Master and Masterkeying system to be coordinated with the Owner.
- * Provide key cabinet and key organizing system.
- * Electrified hardware: Electrified Hardware to be used for security purposes must be UL listed for Burglary Applications.
- * Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set, unless otherwise indicated.
- * Exit Devices: Exit devices shall be touchpad type, fabricated stainless steel. Provide electrical options as scheduled.
- * Lock Power Supplies: It is imperative that the security contractor and hardware supplier coordinate the lock voltage requirements, fail safe/fail secure requirements, lock in-rush current requirements, whether locks are continuous duty or not and any other related issues. Power supplies to be furnished by Door Hardware Suppliers and installed by the Security of Electrical Contractor. Locate power supplies and battery backup in the access control mechanical space when wire run lengths permit.
- * "Request to Exit / Touch Bar Monitor," Electrified Panic Hardware shall be provided with one internal SPDT switch which monitors the touch bar, as called for on the security system drawings.
- * Closers: Provide at all access controlled doors and at doors specified in the door hardware schedule.

C1030.20 Interior Entrance Doors

- * Aluminum entrance doors and storefront framing system matching the entrance doors, single glazed with 1/4 inch thick clear tempered safety glass.
- * **Hardware:** Full height continuous hinges; offset tubular pulls; tubular push bars full width of door; exposed closers.
- * Security Glazing: LTI Smart Glass, Inc.; School Guard Glass SG4 at designated locations

C1030.40 Interior Coiling Doors

Coiling Grille at Servery and Tray Return Window: Overhead coiling aluminum open link style grille with brushed aluminum finish. Electrically operated.

Coiling Grille at Media Center: Overhead coiling aluminum open link style grille with brushed aluminum finish. Electrically operated.

Coiling Grille at Gang Toilet Room (both ends): Overhead coiling aluminum open link style grille with brushed aluminum finish. Electrically operated.

C1030.80 Interior Access Doors and Panels

Access Doors: Furnish metal access doors to provide access to plumbing, mechanical, and electrical controls. Flush access doors with exposed flanges in nominal 14-gauge steel sheet, factory primed for field painting. Provide 16-gauge stainless steel sheet for wall locations with ceramic tile finish and in kitchen. Furnish fire-rated units for installation in fire-rated walls and fire-rated ceiling assemblies.

Typical door size is 12 x 12 inches with larger sized as indicated.

C1030. Pivot Doors (Stage)

Pivot Door System: Stainless steel anodized double acting pivot hardware.

Basis of Design: FristJurgens System 3

C1070 Suspended Ceiling Construction

C1070.10 Acoustical Suspended Ceilings

Acoustical Ceiling: Acoustical lay-in panels, size as scheduled in the finish schedule, supported by steel double-web grid with **standard 15/16"** wide aluminum face cap.

- In enclosed areas, provide wet-felted mineral fiber panels.
- In open office areas, unless floor-ceiling or roof ceiling assembly is required to be rated (alternate to fireproofing), provide high-NRC fiberglass panels.

Classrooms to have NRC not less than 0.70, Music Rooms to have NRC not less than 0.80.

Acoustical Ceiling, scrubbable: Mineral-fiber lay-in panels with scrubbable aluminum or mylar face; supported by steel double-web grid with standard 15/16" wide aluminum face cap. NRC not less than 0.70.

C1070.20 Suspended Plaster and Gypsum Board Ceilings

Gypsum Board, Painted: Suspended gypsum board assembly with joints taped and finished; painted with 1-coat PVA primer and 2 top coats of flat latex paint.

C1070.50 Specialty Suspended Ceilings

Linear Wood Ceilings: (Low ceiling area of cafeteria) Linear, reveal, 4 ½" planks suspended from standard 15/16-inch HD T-bar suspension system with acoustical blanket.

Basis of design: Rulon, Linear Open

Sound Diffusing Panels, Band & Chorus Room: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.

- (1) Basis of Design Product: Wenger; Pyramidal Diffuser Panels.
- (2) Panel Shape: Pyramidal.
- (3) Mounting: Back mounted with manufacturer's standard suspension system, secured to substrate.
- (4) Core: Manufacturer's standard, prepared for required acoustical performance.
- (5) Edge Construction: Manufacturer's standard chemically hardened core with no frame.
- (6) Acoustical Performance: Sound absorption SAA of 0.15 to 0.25 according to ASTM C 423 for Type A mounting according to ASTM E 795.
- (7) If retaining dimensions in "Panel Width" and "Panel Height" subparagraphs below, clarify direction of dimensions on Drawings.
- (8) Panel Size: 24 x 24 inches.

Sound Reflecting Ceiling Panels (Stage): Prefabricated, sound reflectors; manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.

- (1) Basis of Design Product: Kinetics Noise Control; Ovation Reflector Panels.
- (2) Panel Shape: Flat
- (3) Mounting: Back mounted with suspension system secured to substrate.
- (4) Core: Manufacturer's standard plywood core, 3/4-inch thickness.
- (5) Edge Construction: Manufacturer's standard, stained to match panel face.
- (6) Facing Material: White maple wood veneer.
- (7) Color: Clear
- (8) Acoustical Performance: Highly acoustically reflective with not less than 0.05 Sabines of absorption per square foot of panel for all 1/3 octave band frequencies in the 200 Hz to 2000 Hz range according to ASTM C 423 for Type J mounting according to ASTM E 795.
- (9) Weight of Reflector Panel: No less than 2 psf and a maximum of 2.5 psf, and excludes steel framing weight.
- (10) Panel Sizes: As indicated on Drawings.

A. **Ceiling Clouds (Auditorium):** Prefabricated, acoustic clouds; manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.

- (1) Basis of Design Product: ASI Cloud Convex
- (2) <https://www.asiarchitectural.com/products/cloud/>

- (3) Panel Shape: Curved
- (4) Mounting: Suspended
- (5) Core: Manufacturer's standard plywood core, 3/4-inch thickness.
- (6) Edge Construction: Manufacturer's standard, stained to match panel face.
- (7) Facing Material: Maple wood veneer.
- (8) Color: Clear
- (9) Acoustical Performance: 1" Absorptive

C1070.60 Spray Applied Ceiling Finishes

Sprayed Acoustic Insulation: ICC-K13 or Sonospray fc, as noted on drawings

C1070.70 Special Function Ceilings

Exposed Structure (Painted): Shop-primed steel structure; field painted with spray-applied alkyd flat finish.

DEFS: Cement Board sheathing directly applied stucco finish for soffits at underside of loading dock canopy

C1090 Interior Specialties

C1090.10 Interior Railings and Handrails

See Sm-b Shell for steel stair handrail, guard rail

Catwalk: Schedule 40 steel pipe guardrails with 4 inch high steel plate toe kick; with two horizontal rails with outriggers for lighting.

C1090.20 Information Specialties

Display cases: Illuminated display cases with factory fabricated recessed cabinet, tackboard assembly on back inside surface, operable glazed doors at front, and trim on face to cover edge of recessed opening; 6 mm thick tempered glass. (A-Wing Corridor)

Interior signage: Interior plastic panel signs for room identification, including tactile characters and Braille for handicapped accessibility. Provide light-sensitive, water-wash photopolymer face layer bonded to a phenolic base layer to produce a composite sheet with overall, face-layer, and base-layer thickness of 1/8-inch; and a Type D Shore durometer hardness of 80.

Basis-of-Design Product: ASI Sign Systems, Inc.; InTouch.

Field applied, vinyl character signs: Characters die cut from 2-mil thick, weather-resistant vinyl film with release liner on the back and carrier film on the front for on-site alignment and application on glazing. Provide room identification sign on exterior window, one per room, for exterior identification. Basis-of-Design Product: ASI Sign Systems, Inc.; LTV Series Dimensional Letters.

Markerboards: Wall-mounted porcelain on steel markerboards with extruded aluminum trim and chalk tray, and tack-strip along top of board. Claridge or Greensteel.

Tackboards: ¼-inch thick minimum, linoleum resilient tackable surface material, factory laminated to 1/4"-inch-thick hardboard backing.

Tackboards are included in select classrooms and corridor locations, for quantities and sizes see drawings.

Tack Strip: 6 inch high vinyl-coated cork installed above teaching wall whiteboards in classrooms.

Art Display Rail – Extruded aluminum display rail, anodized silver, wall mounted.

Basis of Design: AS Hanging Display Systems, Casso Display Rail

C1090.25 Compartments and Cubicles

Toilet Compartments:

Plastic panel compartment and urinal screens, fabricated from high density polyethylene, as manufactured by Capital, Comtec, Santan or Sanymetal

Shower Room Dressing Compartments: Same as the toilet compartments.

Student Wardrobe Lockers & PE Lockers: 15"x 15" double-tier heavy-duty, all-welded, wardrobe lockers are provided for the students and located in the hallways. 100 Units (200 Lockers) Wardrobe lockers will be double-tier, 6-feet high, painted steel with louvers in the doors, with built-in electronic locks.

Athletic/Team Lockers: Athletic lockers are provided in the gymnasium team locker rooms. Athletic lockers will be painted steel lockers heavy-duty, all-welded with expanded metal doors and sides for ventilation, with padlock rings. 24" wide, 15" deep, 72" high.

Accessories: Locker room benches with laminated wood seats

Kitchen, Custodial and Planning Room Lockers: Double-tier, 6-feet high, painted steel with louvers in the doors, with built-in combination locks. Accessories: Sloped tops, legs and fascia panel.

(1) Basis of Design Product: Penco Products, Inc.; Vanguard Lockers.

(2) Size: 15 x 15 x 72 inches.

(3) Color: As selected by Architect from manufacturer's full range.

Wardrobe and Closet Specialties: A plastic laminate covered particleboard shelf and chrome coat rod will be provided at each closet.

Mirrors: Unframed mirrors consisting of film-backed, silvered flat glass mirror with top and bottom aluminum J-channels; for Alt PE room.

C1090.35 Wall and Door Protection

Wall and Corner Guards: Stainless steel corner guards in kitchen areas and loading dock corridors.

C1090.40 Toilet, Bath, and Laundry Accessories

Toilet Accessories:

Toilet and bath accessories: Surface mounted, stainless steel accessories including the following:

- (1) Waste receptacles, semi-recessed, 12 gal capacity at single unisex, 18 gal at gang toilets
- (2) Grab bars at handicapped toilet locations.
- (3) Framed mirrors at all sink locations.
- (4) Sanitary napkin disposal units.
- (5) Mop/broom holders for each Custodian closet.

Shower Accessories: Fold-down seats, grab bars, shower curtains and curtain hooks; and robe hooks for shower rooms.

Miscellaneous Accessories: Mop holder for janitor's closets. C1090.60

Safety Specialties:

Emergency key cabinet: Recessed mounted, high security key vault located at exterior of main entrance door for emergency responder access to the facility.

Lab Safety Equipment to be supplied by Owner and installed by contractor.

C1090.90 Other Interior Specialties

Interior Signage: Provide room identification signs, directional signage, safety signs. Type and extent to be determined.

C20 INTERIOR FINISHES

C2010 Wall Finishes

C2010.10 Tile Wall Finish

Ceramic Tile: Classroom Entries: Matte, 1 x 6", full height. Epoxy grout.

Basis of Design Product: Garden State Tile: Stick

Ceramic Tile: Restrooms and Water Fountain wet wall: Glazed, 4" x 8" ceramic tile, door frame height. Epoxy grout.

Basis of Design Product: Creative Materials: MOSA Classic Tides

Ceramic Tile: Restrooms non-wet-wall walls: Matte, 4" x 16" ceramic tile, door frame height. Epoxy grout.

Basis of Design Product: Daltile: Color Wheel Linear

Ceramic Tile: Servery/Kitchen West Wall: Satin, 2" x 8" ceramic tile, Ceiling height. Epoxy grout.

Basis of Design Product: Prospec: Gruppo Bardelli

Porcelain Tile: Cafeteria, Bathroom corridors, Academic wings, Arts wing & PE wing corridors: Unglazed, 12" x 24" porcelain tile, wainscot height.

1. Basis of Design Product: Creative Materials: Pinnacle

Large format porcelain tile

- (1) For sizes; 15 inches or larger.
- (2) Use large format tile (LFT) mortar; with latex additive, on cement board
- (3) substrate.
- (4) Install with control joints; every 20-25 feet.
- (5) Flatness; 1/8 inch in 10 feet.
- (6) Crack isolation membrane or waterproofing membrane at wet areas; full membrane installation, do not bridge control joints.

C2010.20 Wall Paneling

Wood Paneling: Auditorium, LGI, Media Center and Main Corridor (Spine/Caf)

Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.

- (1) Basis-of-Design Product: Rulon; Flat Veneer Wall System.
- (2) Panel Shape: Flat.
- (3) Mounting: Adhesive and mechanically fastened with Z-clips secured to substrate, unless noted otherwise.
- (4) Core: Manufacturer's standard plywood core, 3/4-inch thickness.
- (5) Edge Construction: Manufacturer's standard stained to match panel face.
- (6) Facing Material: Maple veneer.
- (7) Installation: Z-clip.

C2010.30 Wall Coverings

Wall Protection, Kitchen and Utility: Impact resistant sheet wall covering fabricated from fiberglass reinforced plastic; 3/32-inch sheet thickness with smooth finish, Class A flame spread and smoke developed index.

- (1) Basis-of-Design Product: Marlite; Standard FRP Panels.
- (2) Color: As selected by Architect from manufacturer's full range.
- (3) Trim and Joint Moldings: Extruded rigid plastic that matches sheet wall covering color.
- (4) Flame-Spread and Smoke Developed Index: 25/450 (Class A).
- (5) Mounting: Adhesive.

C2010.70 Wall Painting and Coating

CMU: One coat latex block filler with two finish coats, low luster paint.

Gypsum Board: One coat latex primer with two finish coats, low luster paint.

C2010.80 Acoustical Wall Treatment

Acoustical Wood Fiber Wall Panels: (Gymnasium, Alt PE, Cafeteria, LGI) Tectum "Finale Fabri-Tough" Panels, or equal panel constructed of aspen wood fibers bonded with inorganic hydraulic cement; 2-inches thick, factory painted.

Acoustical Wood Panels: (Exterior of Lighting Booth, Entry Lobby) ASI Audition Panels or Equal.

- (1) Panel Size: Custom, as indicated on Drawings.
- (2) Panel Thickness: 3/4 inch.
- (3) Core: Class A FR MDF Board.
- (4) Veneer: White maple.
- (5) Edge Profile: Square.
- (6) Edge Banding: Match veneer species.
- (7) Kerf: 1.6 mm.
- (8) Perforation Size: 8 mm with 16 mm spacing, staggered.
- (9) Finish: Custom stain to match Architect's sample

High-Impact Wall Panels (non-acoustic):

- B. Location: Gymnasium above mats

Basis of Design: Hollman High Impact Wall Panels

Fabric-Faced Acoustical Wood Fiber Wall Panels:

Back mounted, fixed sound absorptive panels with a nominal core thickness of 2 inches; manufacturer's standard panel construction consisting of high density, ultra-fine fiberglass mat facing material laminated with acoustically transparent adhesive to front face, edges, and back border of dimensionally stable, rigid glass-fiber board core; with edges chemically hardened or impact resistant and resilient to reinforce panel perimeter against warpage and damage. Acoustical Performance: Sound absorption NRC of 0.85 according to ASTM C 423 for Type D5 mounting according to ASTM E 795. Facing Material:

Location: Band and Chorus and Auditorium

Acoustical Shaped Panels: Manufacturer's standard panel construction consisting of rigid thermo-formed plastic in pyramidal, dome, or barrel configuration as recommended by acoustical consultant. Product: Decoustics Limited; Dome Diffuser or similar.

Location: Band and Chorus

C2010.90 Wall Finish Supplementary Components

Painted CMU: Exposed concrete unit masonry, finished with acrylic block filler and 2 coats of epoxy paint.

Ground Face Block: Exposed concrete unit masonry, finished with 2 coats of epoxy paint.

Gypsum Board, Latex Paint: Gypsum board with joints taped and finished; painted with 1-coat primer and 2 top coats of low-VOC latex paint.

C2020 Interior Fabrications

Simulated Stone Window Sills: Solid surface material, ½ inch thickness with built-up eased edge. Basis of Design Product: Corian.

C2030 Flooring

C2030.10 Flooring Treatment

Sealed Concrete: Additional coat of clear sealer/dustproofer, specified as Concrete work.

C2030.20 Tile Flooring

Porcelain Tile (Corridors): Unglazed porcelain paver tile; varied size tiles, provide crack isolation membrane.

Basis-of-Design Product: Prospec, Casalgrande Padana: Stile, grip finish

Large format porcelain tile

- (1) For sizes; 15 inches or larger.
- (2) Use large format tile (LFT) mortar; medium bed, with latex additive.
- (3) Install with control joints; align tile joints and slab cuts, every 20-25 feet.
- (4) Flatness; 1/8 inch in 10 feet.
- (5) Crack isolation membrane or waterproofing membrane at wet areas; full membrane installation, do not bridge slab cuts.

Ceramic Tile (Restrooms): Unglazed mosaic tile, 12" x 24", epoxy grout. Base: metal edge trim.

Basis-of-Design Product: Daltile: Assemble, Matte finish

C2030.45 Wood Flooring

Wood Strip Flooring (stage): Hard maple strip flooring with tongue-and-groove edges nailed to plywood subfloor. Finish after installation with stain and 3 coats water-borne urethane.

C2030.50 Resilient Flooring

- C. **Linoleum (classrooms, academic corridors):** Linoleum Sheet Flooring: Linoleum sheet with backing, 0.08 inch thickness, with manufacturer's standard water based surface treatment to reduce maintenance.

Basis of Design Product (1st Floor): Forbo Flooring; Marmoleum Real; Marmoleum Concrete; Marmoleum Walton; and Marmoleum Striato

Basis of Design Product (2nd Floor): Forbo Flooring; Marmoleum Real in Decibel (impact sound reduction of 18dB). Marmoleum Real; Marmoleum Concrete; Marmoleum Walton; and Marmoleum Striato

- D. **Rubber Tile (Science Labs):** Modular tile, 24 x 24 inches, 3 mm thickness.

Basis of Design Product: Nora flooring; Noraplan Environcare.

- E. **Rubber Tile (Locker Rooms, Athletics corridor):** Modular tile, 24 x 24 inches, 3 mm thickness.

Basis of Design Product: Nora Flooring: Norament 992 Grano 9mm

C2030.70 Fluid-Applied Flooring

- F. **Epoxy Resinous Seamless Flooring:**

- G. Resinous Flooring (ER): Abrasion-, impact- and chemical-resistant, epoxy/urethane - based, monolithic floor surfacing including preparation, primers and finish coats, designed to produce a seamless floor and integral cove base.

Basis of Design Product: Sikafloor Decodur Quartz UEF

C2030.75 Carpeting

Carpet: Nylon broadloom, glued down, carpet tile

Basis of Design Product: SHAW; Collective; In Tune and Alongside, 9" x 36" Planks

Washable Carpet: (LGI) Forbo Flotex

C2030.80 Athletic Flooring

Wood Athletic Flooring:

Wood Athletic Flooring (Gymnasium, Alt PE): Anchored resilient wood athletic flooring system consisting of 25/32-inch wide maple flooring over continuous subfloor sheathing on anchored wide body sleepers over resilient pads, with a system depth of 2-1/2 inches. Apply gymnasium floor finish and painted game markings.

Basis of Design Product: Action Floor Systems LLC; ProAir AR.

Resilient Athletic Flooring: (Weight Rm) Rubber floor tile. Vulcanized composition rubber and EPDM granules in both underlayment and wear surfaces with a wear and weather resistant polyurethane. Slightly textures, standard 24" square interlocking tile, 2-3/4" thick.

Basis of design: Pliteq; GenieMat 70.

Sport Sheet Flooring: (Alt PE) ASTM F2772 Shock Absorbent sheet flooring, 9.00m

Basis of Design Product: Gerflor: Taraflex Sport M Performance

C2030.85 Entrance Flooring

Entrance Mat: Extruded aluminum grille set in frame recessed in floor; Construction Specialties Inc. "Pedigrid." Provide manufacturer's standard foot-grille assemblies consisting of treads of type and profile indicated, interlocked or joined together by cross members, and with support legs (if any) and other components needed to produce a complete installation.

- (1) Basis of Design Product: Mats, Inc.; Dual Track.
- (2) Aluminum Foot Grilles: Provide manufacturer's standard foot grilles, bolt-through design, with extruded members, top-surfaced tread rails, and as follows:

Entrance Mats: See Part E, Equipment and Furnishings. 100% solution dyed, UV stabilized polypropylene carpet bonded to high density rubber backing to form mats 3/8-thick.

Basis of Design Product: Mats Inc.; Berber RB.

Entrance Grilles and Frames: Thin line "T" shaped extruded aluminum blades bolted together, suitable for recessed shallow-pit installation, nominal depth 1-1/2" to 2". "Dual Track" by Mats, Inc.

- (1) Tread Rails: T-Shaped blades, 1-5/16 x 1/8 x 1-1/2 inch size, combined with T shaped blades 11/16 x 1/8" with anti-slip polymer C9065 insert.
- (2) Tread Rail Spacing: 1/8- to 3/16-inch- wide openings between treads.
- (3) Drying Insert: Nylon material.
- (4) Grille Size: As indicated, panels not to exceed 48" x 42".

Roll-up Entrance Mats: Level-cut-pile nylon carpet, bonded to 1/8- to 1/4-inch-thick flexible vinyl backing, to form mats 3/8- or 7/16-inch-thick with nonraveling edges.

C2030.90 Flooring Supplementary Components

Resilient Wall Base: Type TP (rubber, thermoplastic) cove base with toe, 4-inch high, coil lengths, and job formed inside and outside corners.

C2040 Stair Finishes

Steel components shop primed and field painted with alkyd paint system

C2040.50 Resilient Stair Finish

Tread and Landing Finish: Rubber tread covers, with rubber tile at landings.

Basis of Design Product: Tarkett

C2040.60 Terrazzo Stair Finish

Precast Terrazzo Units for Stair Treads (monumental & cafeteria stairs): Minimum 3/4-inch- thick, reinforced, portland cement terrazzo units. Comply with NTMA's written recommendations for fabricating precast terrazzo units in sizes and profiles indicated. Reinforce units as required by unit sizes, profiles, and thicknesses and as recommended by manufacturer. Finish exposed-to-view edges and reveals to match face finish. Ease exposed edges to 1/8-inch radius.

Basis of Design Product: Tectura Designs; Cementitious Tread Risers.

C2050 Ceiling Finishes

C2050.10 Plaster and Gypsum Board Finish

Suspended gypsum board assembly with joints taped and finished to Level 4; field painted with one coat latex primer and two finish coats of flat latex paint.

Exposed Structure: Shop-primed steel structure, galvanized metal deck; field painted with spray-applied latex flat dry fall paint.

D SERVICES

D10 CONVEYING

D1010.10 Elevators

Elevator: Elevators: One (1). Class A. MRL (Machine Room Less) traction elevator, 5,000 pound capacity, . .

Acceptable Manufacturers: KONE Inc., Otis Elevator Co, Thyssen Krupp, Mitsubishi.

Comply with the Massachusetts State Building Code as amended, and the Elevator Regulations of the Commonwealth of Massachusetts, 524 CMR 17.00.

1. Rated Speed: 150 fpm.
2. Number of Stops: Three at front.
3. Cab size to accommodate stretcher.
4. Operation System: automatic operation.
5. Auxiliary Operations:
 - a. Standby-power operation (generator).
 - b. Automatic operation of lights and ventilation fans.
6. Security Features: Card-reader operation.
7. Car Enclosures:
 - a. Clear Inside Width: 6'-8" from side wall to side wall.
 - b. Clear Inside Depth: 5'-5" from back wall to front wall.
 - c. Inside Height: 7'-4" inches to underside of ceiling, or Manufacturer's standard.
 - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish with integral car door frames.
 - e. Car Fixtures: Satin stainless steel, No. 4 finish.
 - 1) Side and Rear Wall Panels: Plastic laminate.
 - f. Reveals: Satin stainless steel, No. 4 finish.
 - g. Door Faces (Interior): Stainless steel.
 - h. Door Sills: Aluminum, mill finish.
 - i. Ceiling: Satin stainless steel, No. 4 finish.
 - j. Handrails: 1-1/2 inch diameter, satin stainless steel, No. 4 finish, at sides of car.

D SERVICES

D20 PLUMBING

Codes And Standards:

248 CMR 10.00: Massachusetts Uniform State Plumbing Code

780 CMR, 10th edition (based on 2021 IBC with Massachusetts Stretch Code amendments).

Soil Gas Control Systems in New Construction of Buildings, ANSI CC-1000 (2017)

Massachusetts Fire Prevention Code 527 CMR

D2000 General Design Considerations

Provide new plumbing systems for the new high school.

All products, equipment, valves, fittings and related appurtenances shall be approved by the Massachusetts Board of State Examiners of Plumbers and Gas Fitters.

Lead Content Limits: All applicable wetted components shall comply with the Safe Water Drinking Act (SWDA) lead reduction requirements of the Federal Reduction of Lead in Drinking Water Act – 2011.

Scope of Work

Scope of work will include the installation of new systems to accommodate the new building configuration. The plumbing systems shall be designed according to LEED v4 for Schools standards, with a goal of 30% water efficiency.

- Plumbing fixtures and trim.
- Domestic cold water and hot water distribution systems.
- Science classroom protected water systems and acid waste systems..
- Sanitary waste and vent systems.
- Kitchen waste and vent systems.
- Storm water drainage systems.
- Radon mitigation system.
- Foundation drainage system (by site)

D2010 Domestic Water Distribution

D2010.20 Domestic Water Equipment

Water meter: Type and style as required by the local water department, and sized for the peak intermittent demands of the building. Piping arrangement at meter installation to be as required by the local water department.

Hose Bibbs: Shall be chrome plated, wall mounted, with integral vacuum breaker, and loose key handle. They shall be located in each toilet room, and all rooms containing a floor drain.

Wall Hydrants: Freeze proof wall hydrants will be provided around the building. Locations and quantities will be coordinated with the owner to be in convenient locations. (The plumbing code minimum distance requirements between hose connections only applies to residential occupancies). Three (3) roof top hydrants will be provided to wash down mechanical roof top equipment.

D2010.40 Domestic Water Piping

Cold Water: The cold water supply system will be extended 10'-0" from the inside face of the building's foundation wall and connect to the water system supplied by the Town of East Longmeadow. A 6" domestic water service will enter the building at the water service room. The service entrance will be equipped with a strainer, water meter, and a Massachusetts approved 6" master reduced pressure backflow preventer downstream of the water meter. There is an existing meter pit on the domestic service to the existing school. Per discussions with the water department, this meter will remain and the new school system will be fed from new piping exiting the meter pit. A capped 3-inch water connection will be provided at one of the entry vestibules for future use.

Additional backflow preventers will be provided as needed for equipment and systems such as HVAC equipment, ice machines, dishwashers and coffee makers.

Domestic cold water will be piped with lead-free type L hard-drawn copper with lead-free soldered joints. Domestic cold water piping will be insulated and distributed throughout the building serving all fixtures and equipment requiring cold water.

Provide a deduct water meter, Massachusetts approved 3" reduced pressure backflow preventer, shut-off valve and quick disconnect type fitting for blowing out site irrigation system.

Hot Water: Domestic hot water will be provided by three commercial electric water heaters in parallel. Water heaters will include a 20-year full warrantee. Each heater will be sized to provide 66% of the hot water demand. Water will be heated to 140°F. The 140°F water will serve the kitchen equipment. A central master thermostatic mixing valve will reduce the temperature to 120°F for delivery to all other fixtures demanding hot water throughout the school. Thermostatic mixing valves will be digital. Hand wash lavatories and showers will have integral temperature limit stops to provide a maximum of 110°F from the fixtures.

Emergency shower station(s) will need to be provided in the mechanical/boiler room and within the science/lab classrooms. The emergency equipment will be fed from the domestic hot water system with emergency thermostatic mixing valves provided at each emergency shower station.

Domestic hot water will be piped with lead-free type L hard-drawn copper with lead-free soldered joints. Domestic hot water piping will be insulated and distributed throughout the building serving all fixtures and equipment requiring hot water.

Designation	Description	Operating Temperature
140°	Domestic Hot Water (Kitchen, 140°F)	140 Deg. F.
HW	Domestic Hot Water	120 Deg. F.
	Public Lavatory Faucets (Tempered at faucet)	110 Deg. F.

Hot water re-circulation: Hot water supply piping shall be re-circulated from the remote ends of the system, and returned to the water heaters, to maintain system temperature. Re-circulation loops to be provided with stainless steel bodied circulator pumps, operated by immersion aquastats. Hot water will be circulated directly behind all lavatories and other low-flow fixtures.

The science classrooms will require a protected hot water, cold water, and hot water return system. The protected water systems will start downstream of the backflow preventers and the temperature in the piping will be maintained by a local electric water heater (loop re-heat). The reheat water rooms are located on the second floor in part E, and on the first floor in part D.

D2010.60 PLUMBING FIXTURES

General: Plumbing fixtures will be equipped with the following water conserving features (for 30% indoor water use reduction-LEED- WE Credit).

Plumbing fixtures will be mounted in accordance with the plumbing code and industry standards. Fixtures designated as “accessible” will be mounted in accordance with the regulations of the Massachusetts Architectural Access Board (MAAB) and the Americans with Disabilities Act Architectural Guidelines (ADA). As required by MAAB or ADA, a percentage of water closets, urinals, lavatories, sinks, drinking fountains and showers will be made accessible.

Each fixture shall be connected to the piping with separate isolation valves for ease of maintenance.

Water Closets: Commercial grade, white vitreous china, wall hung, elongated bowl, 1.28 GPF, with exposed, sensor operated flush valve, and open front white plastic seat and self-sustaining check hinge. Fixture to be mounted on commercial grade, floor supported chair carrier.

Urinals: Commercial grade, white vitreous china, wall hung, 0.125 GPF, with exposed, sensor operated, flush valve. Fixture to be mounted on commercial grade, floor supported chair carrier.

Lavatories: Commercial grade, white vitreous china, under-mount type, with front overflow. Fixtures will be metering type with an open grid drain, supplies with stops, and "P" trap. Faucet flow rates will be limited to 0.35 gpm. Those fixtures designated as accessible, are to have the exposed water and waste piping below the counter insulated.

Student toilet rooms will be provided with individual wall mounted, lavatories. Fixtures to be provided with chrome plated, temperature selecting and metering faucet, open grid drain, supplies with stops, and "P" trap.

Sink: MAAB/ADA stainless steel countertop sink with gooseneck faucet and 0.5 GPM aerator.

Laboratory Sinks: Faucets with vacuum breakers and 1.0 GPM aerators.

Nurse's room: Commercial grade, 18-gauge, type 302 stainless steel, counter-mounted, with gooseneck faucet and wrist blades. Provide eyewash at sink.

Science Labs: Sinks within science classrooms and prep rooms will be integral with the counter. Lab sinks and faucets will be furnished by the casework contractor and installed by the plumbing contractor. Faucets will be provided with vacuum breakers and 1.5 gpm aerators. The lab waste will be collected underground and flow through a limestone chip tank. Two are anticipated. One in part D and one in part E.

Showers: Showers are to be constructed in place and be equipped with pressure balanced, single handle mixers. Shower heads to be institutional grade, adjustable type, 1.5 GPM flow. Accessible showers will be equipped with a standard shower head and a shower head mounted on a wall slide bar, with flexible supply hose.

Drinking Fountains/Cooler: Commercial grade, wall hung, stainless steel finish, self-contained electric water cooler type, with bottle filler. Fixtures to be dual height to satisfy Massachusetts Architectural Access Board (MAAB) requirements.

Janitors sinks: Floor mounted mop service basins, molded plastic composition, with stainless steel grid drain. Provide with chrome plated mixing faucet, bumper guards on basin rim, and stainless steel wall splash guard.

Emergency Plumbing Fixtures: Emergency shower and eyewash units will be provided in areas where chemical and/or gas services are present and where chemical treatment of systems is performed. There will not be floor drains at emergency equipment. In mechanical rooms, emergency shower and eyewash units will be free-standing units. In the nurse's room, there will be an eyewash unit countertop mounted with a 90 degree swivel.

Hose Bibbs: Shall be chrome plated, wall mounted, with integral vacuum breaker, and loose key handle. They shall be located in each toilet room, and all rooms containing a

floor drain. Exterior Wall Hydrants: Shall be non-freeze type with integral vacuum breaker. They shall be strategically placed around the building and mounted approximately 18 inches above grade. One will also be provided on each roof with HVAC equipment on it.

D2010.90 Domestic Water Distribution Supplementary Components

Insulation will be applied to cold water, hot water, hot water re-circulation, and horizontal storm drain piping. It will be continuous through supports and include a vapor retarding jacket. Cold water piping and storm water piping will be ½" thick. For hot water and hot water recirculation piping, insulation shall be 1" thick.

Exposed piping under fixtures designated for use by the handicapped shall be insulated with pre-molded insulation kits.

Insulation shields to be placed to protect insulation at pipe hangers.

Low-Emitting Materials: All insulation used interior to the vapor barrier will be specified to meet test standards of Indoor Advantage Gold or GreenGuard Children and Schools.

Pipe and Fittings:

Buried Exterior Water Systems: Class 52 cement-lined ductile iron pipe with restrained mechanical joints.

Buried Interior Water Systems: Type K copper with brazed copper joints.

Above Ground Water Piping: Type L copper with 95/5 soldered copper joints.

Water valves: Shut-off valves 3" and smaller shall be full-port ball valve, bronze body, chrome-plated bronze ball. Shut-off valves larger than 3" shall be iron body, bronze mounted, inside screw, non-rising stem gate valve. Balancing valves shall be approved circuit setters.

D2020 Sanitary Drainage

D2020.10 Sanitary Sewerage Equipment

An exterior grease interceptor servicing the kitchen equipment will be installed by the site contractor with oversight from the plumbing contractor. The grease interceptor will be piped separately as described in section D2020.30.

The plumbing code also requires interior grease traps at specific fixtures. The kitchen waste from these fixtures will be connected together and flow through an interceptor. The quantity and locations will be developed during design development. It is assumed that two are required and they will be located within concrete pits below the slab.

D2020.30 Sanitary Sewerage Piping

Piping to be designed to collect liquid wastes from all plumbing fixtures, equipment and drains requiring waste connections.

System to include atmospheric venting system, to maintain trap seals.

Electronically operated trap primer systems will provide make-up water to fixture and drain traps where necessary to maintain liquid trap seals.

Waste and vent piping shall be cast iron for piping 2-1/2" and larger. For pipe sizes 2" and smaller (excluded waste piping from urinals) piping shall be hard copper water tube, drawn temper, type M with wrought-copper, solder-joint DWV fittings.

Buried Storm, Sanitary, Waste and Vent: Cast iron bell and spigot with neoprene gasket joints.

All vent piping on the roof shall be kept at a minimum of 25'-0" away from any HVAC air intakes.

Several building drains will exit the building and connect by gravity drain to the site sanitary sewer system 10'-0" from the inside face of the building's foundation wall.

A separate kitchen waste system will be provided to collect waste from all kitchen sinks and equipment that discharge grease. The kitchen waste will be piped separately from the sanitary waste by gravity to discharge to an exterior grease interceptor. Kitchen waste (and vent) piping to the exterior grease trap will be by the plumbing contractor.

The vent piping from the exterior grease trap will be provided by the plumbing contractor and routed back into the building and to the roof independent from the rest of the sanitary vent system.

Kitchen waste and vent piping will be cast iron.

Point-of-use grease traps: Grease traps will be provided to receive waste discharge from all grease-producing fixtures and equipment. The units will be PDI and ASSE approved and equipped with an automatic draw-off hose. Grease traps will be recessed in the floor.

D2020.90 Sanitary Drainage Supplementary Components

Indirect waste piping: Indirect waste piping receiving cold liquid waste and subject to condensation will be provided with 1/2" thick insulation.

Floor drains: A floor drain will be required in all toilet rooms where more than one water closet/urinal is present. Floor drains will be of cast iron body construction, heavy duty grade, PDI approved. Those for use in toilet rooms and other finished spaces shall be have nickel bronze finishes.

D2030 Building Support Plumbing Systems

D2030.10 Stormwater Drainage Equipment

Open end drains will be provided for condensate collection. Each drain will be provided with a backwater valve and vent. The storm vent cannot connect to the conventional sanitary vent system, and will be run independently up through the roof.

D2030.20 Stormwater Drainage Piping

The systems will collect discharge of storm water from all roof drains. Where possible, the routing will run directly from the roof drain locations, vertically down at building columns or chases and will be collected below the lowest floor slab and will exit the building in multiple locations and terminate 10'-0" from the inside face of the building's foundation wall where it will be continued by the site contractor.

Storm drainage piping shall be cast iron.

Secondary overflow roof drainage systems will be required. Secondary overflow drainage will discharge separately from the main storm drainage system through coordinated locations on the exterior face of the building between 18" above grade.

Secondary overflow storm drainage piping shall be cast iron.

Insulation will be applied to all (primary and secondary) horizontal storm drainage piping and roof drain bodies to prevent condensation. Insulation will be ½" thick and be continuous through supports and include a vapor retarding jacket. Insulation shields will be installed to protect insulation at pipe hangers.

D2030.30 Facility Stormwater Drains

Roof Drains: Shall be cast iron construction, heavy duty, with flashing clamp for membrane roofing, under-deck clamping device, and aluminum domes.

D2060 Process Support Plumbing Systems

D2060.30 Gas Systems

Mechanical systems, kitchen equipment, domestic hot water heaters are all electric. A natural gas service for the school is not required.

Radon:

An underground radon mitigation system will be provided. (Confirmation is required during design development). The vent stacks from the underground system will rise within the building and terminate above the roof individually.

Plenum boxes will be required underground within the building footprint to help with the collection of Radon. Each vent stack will be located within 20 feet of its plenum box.

Buried Radon Trunk Piping: 6" perforated schedule 40 PVC plastic pipe.

Radon Vent Stack Piping: 6" schedule 40 PVC plastic pipe with fittings conforming to ASTM D 1785.

Underdrain System Piping: 6" perforated schedule 40 PVC plastic pipe.

Energy and Water Conservation

Refer to the LEED scorecard (Silver) for the energy and water conservation criteria, as they are part of design and construction objectives. Some aspects of this initiative, as they pertain to the plumbing systems, are listed below:

- Utilization of low-flow plumbing fixtures throughout the building, including 1.28 GPF water closets, 0.125 GPF urinals, 0.5 GPM lavatory faucets, sensor operated faucets and flush valves in common areas, 1.8 GPM shower heads and 1.5 GPM aerators on kitchen faucets.
- Enhanced 3rd party commissioning of systems, including water heaters and circulating pumps with commissioning agent is part of the construction process.
- Water heaters are a minimum of 94% efficient.

D SERVICES**D30 HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS****D3000 Design Basis**

The HVAC system will be based on an air-source heat pump system, as described below.

- Heating and cooling of Classrooms, Administration and similar spaces will be provided from VRF Heat Recovery type air source heat pumps.
- Ventilation for Classrooms, Administration and similar spaces will be from variable volume packaged DX heat pump DOAS units with VAV distribution (DCV).
- Large single-zone spaces will be served with variable volume packaged rooftop DX Heat Pump AHUs. This would apply to Gym, Cafe, Media, LGI and Auditorium.
- The kitchen and Culinary Arts will be supported by hood exhaust fans, a dishwasher fan and associated makeup air units.
- The Science Classrooms will be supported by common lab exhaust fans (one for each wing) with distribution through VAV air valves.
- A proprietary building management system (Schneider Electric, Struxureware) will be provided to monitor and manage the HVAC system and to monitor various energy meters provided with the electrical and plumbing systems.

D3000.10 Reference Standards

Building Code: IBC 2021 with 780 CMR Massachusetts amendments.

International Mechanical Code 2021.

International Energy Conservation Code 2021 with Massachusetts amendments for Stretch Code applies.

Guide Books of The American Society of Heating, Refrigerating and Air Conditioning Engineers.

D3000.20 Outdoor Design Conditions

- Summer: 90°F.D.B./72°F.WB.
- Winter: -5°F.D.B./-6.2°F.WB.

D3000.30 Indoor Design Conditions

- Computer Rooms: 68-75°F.D.B, year-round.
- Elevator Machine Room: Temperature range of 50-90°F (CMR 524).
- All Other Areas: 75°F in Cooling up to 60%RH; 70°F in Heating (no humidification).

Note: Installations requiring specific temperature and humidity control during construction (e.g., gymnasium floor) must be provided by the contractor as part of the installation.

D3000.40 Outdoor Air Ventilation

Minimum outside air will be introduced as required by the greater of ASHRAE Standard 62.1, "Ventilation for Acceptable Indoor Air Quality", International Mechanical Code, or the requirement to make up exhaust air.

D3000.60 Sustainable Design Measures

The project will be certified under the LEED Version 4 for BD+C: New Construction and Major Renovation – Schools certification process, and the following measures will be incorporated into the HVAC system design.

- Fundamental Commissioning and Verification
- Minimum Energy Performance
- Building-Level Energy Metering
- Enhanced Commissioning of equipment and systems.
- Optimize Energy Performance
- Advanced Energy Metering
- Demand Response
- Minimum Indoor Air Quality performance
- Minimum Acoustic Performance
- Enhanced Indoor Air Quality Strategies
- Indoor Air Quality Assessment
- Thermal Comfort Control

D3020 Heating Systems

D3020.70 Decentralized Heating Equipment

Variable Refrigerant Flow (VRF) System: Approximately 250 Tons capacity. Heating (and cooling) will be provided to the primary occupied spaces of the building through the use of a VRF heat recovery system, utilizing air cooled heat pump units to support a system of indoor evaporator terminal units. Cassette units will be used in corridors, selected offices and secondary spaces. Wall-mounted units or cassettes will be used in stairwells. Ducted fan coil units will be used in classrooms, conference rooms and other spaces where the acoustic demands dictate their use.

- The roof-mounted heat pumps will be configured with frost protection (panel heaters or other), organized to facilitate maintenance access and supported by 24"-high roof supports.
- Branch controllers will be provided for each VRF zone for distribution to each fan coil to accommodate simultaneous heating or cooling within each VRF zone.
- The VRF manufacturer's control system shall be installed to support the operation of the system and will interface to the proposed BMS through a BACnet/IP connection.

D3020.90 Heating System Supplementary Components

Electric unit heaters will be provided in selected back-of-house spaces, including storage areas, stairwells and loading dock.

An air curtain with electric heat will be provided at the loading dock door.

Electric heat will be provided for the Concession Stand.

Insulation: Provide 1-1/2" insulation for piping systems in accordance with Energy Code. Provide weatherproof jacket for all exterior piping.

D3030 Cooling Systems

D3030.70 Decentralized Cooling

The proposed systems will provide cooling to support the occupied spaces of the project, as described in section D3020.70, above.

D3030.90 Cooling System Supplementary Components

Ductless split air conditioning units will provide dedicated cooling to data closets and to selected electrical rooms that have transformer loads equal to or larger than 75 kVA. The split units will be configured for low-ambient cooling and the air cooled condensing units will be mounted on the building roof, supported by 24"-high roof rails.

D3050 Facility HVAC Distribution Systems

The following pipe systems shall be proposed, sized and installed in accordance with ASHRAE guidelines and requirements of the energy code.

D3050.10 Facility Condensate Distribution

Cooling condensate drains shall be provided from each indoor evaporator terminal unit and with copper pipe, Type L with soldered or Pro-press type fittings. Piping shall be pitched to gravity drain locations provided by Plumbing. Condensate pumps will be included where required for routing condensate to an acceptable drain. Condensate piping shall be insulated with 1/2" thick fiberglass insulation with FSK jacket.

D3050.20 Facility Refrigerant Distribution

Refrigerant piping will be provided between the air-cooled condensing units or heat pumps and the associated indoor evaporator terminal units using copper tubing, type ACR with brazed fittings. The piping shall be sized and installed according to the requirements of the VRF or split system manufacturer based on their system requirements. All piping shall be insulated with closed-cell insulation in accordance with the energy code: 1-1/2" insulation thickness. Outdoor piping will include a weatherproof PVC jacket.

The configuration of the piping and the use of a two-pipe or a three-pipe system shall be based on the selected VRF system manufacturer. Manufacturer-specific fittings and connections system shall be provided as required by the selected system.

D3050.50 HVAC Air Distribution

Galvanized (G90) sheet metal shall be used for all distribution from rooftop units and fan coil units for supply and return ductwork, as well as for general exhaust installations.

Aluminum ductwork shall be used for dishwasher exhaust and for exhaust/return associated with the locker rooms.

Black iron ductwork shall be used for all kitchen hood exhaust systems.

D3050.90 Facility Distribution Systems Supplementary Components

The piping systems testing, adjusting and balancing will be performed by an Air Balancing Contractor certified by either Associated Air Balance Council (AABC), or National Environmental Balancing Bureau (NEBB).

D3060 Ventilation

D3060.10 Supply Air

Conditioned ventilation supply air will be distributed using single-duct variable air volume boxes. Individual VAV boxes will be controlled according to the occupied schedule and/or using carbon dioxide sensors for demand controlled ventilation.

AHUs and DOAS Units described below will be standalone air source heat pump units, as follows:

Air Handling Units - The units will be packaged air-source heat pump units to provide heating and air conditioning of the supply air. An energy recovery wheel will recover return air energy to condition the outdoor air prior to mechanically heating or cooling the supply air. Individual AHUs will serve the following zones.

- Gymnasium – one (1) unit at 20,000 cfm and one (1) unit at 7,000 cfm
- Cafeteria – 13,000 cfm

- Spine – 6,000 cfm
- Media Center – 4,000 cfm
- Large Group Instruction – 4,000 cfm
- Auditorium + Stage – 12,000 cfm

The air handling units will be configured as packaged DX heat pump units. Each AHU will be configured as follows:

- Roof-mounted air handling unit with double wall casing and 3” expanded foam insulation.
- 24-inch-high roof curb, insulated with vibration isolation.
- Supply Air Tunnel
 - Outdoor intake louver and minimum OA louver with intake section with motorized isolation dampers, air flow measuring stations and low-point drain for moisture that collects.
 - MERV 10 and MERV 14 intake filters, each with DP switches and outdoor magnahelic gauges.
 - High-efficiency energy wheel: minimum 80% summer/winter effectiveness.
 - Bypass dampers at the wheel on both the supply and exhaust air tunnels.
 - DX heat pump coil and hot gas reheat coil.
 - Electric coil with SCR control for full heat capacity during heat pump defrost cycles.
 - Supply fans with EC motors: minimum two fans with motorized isolation dampers.
 - Supply outlet with motorized isolation damper.
- Return/Exhaust Air Tunnel
 - Return/Exhaust air inlet with motorized isolation damper.
 - MERV 10 air filter with DP switch and outdoor magnahelic gauge.
 - Common energy wheel with bypass dampers (described above)
 - Return fans with EC motors; minimum two fans with motorized isolation dampers.
 - Exhaust section with motorized isolation damper and exhaust louver.

Dedicated Outdoor Air System (DOAS) Units - Energy recovery units will provide the required ventilation and makeup air to the occupied spaces. The DOAS units will provide general exhaust and will also exhaust selected utility spaces and restrooms. The units will be based on packaged heat pump units to provide heating and air conditioning of the supply air. An energy recovery wheel will recover return air energy to condition the outdoor air prior to mechanically heating or cooling the supply air. Individual DOAS units will serve the following zones.

- Town Offices/Admin – 4,000 cfm
- Arts Wing – 5,000 cfm
- Guidance – 3,000 cfm
- Alt Gym/Lockers – 4,500 cfm
- Classrooms East – two (2) units at 8,000 cfm each
- Classrooms West – two (2) units 9,000 cfm each

The units will include the following features.

- Double wall casing with 3-inch expanded foam insulation.
- 24-inch-high roof curb, insulated with vibration isolation.
- Supply Air Tunnel
 - Outdoor intake louver with intake section with motorized isolation damper, air flow measuring station and low-point drain for moisture that collects.
 - MERV 10 and MERV 14 intake filters, each with DP switches and outdoor magnahelic gauges.
 - High-efficiency energy wheel: minimum 80% summer/winter effectiveness.
 - Bypass dampers at the wheel on both the supply and exhaust air tunnels.
 - DX heat pump coil and hot gas reheat coil.
 - Electric coil with SCR control for full heat capacity during heat pump defrost cycles.
 - Supply fans with EC motors: minimum two fans with motorized isolation dampers.
 - Supply outlet with motorized isolation damper.
- Return/Exhaust Air Tunnel
 - Exhaust air inlet with motorized isolation damper.
 - MERV 10 air filter with DP switch and outdoor magnahelic gauge.
 - Common energy wheel with bypass dampers (described above)
 - Exhaust fans with EC motors; minimum two fans with motorized isolation dampers.
 - Exhaust section with motorized isolation damper and exhaust louver.

Kitchen Makeup Air Unit – Packaged heat pump unit providing conditioned outdoor air to the kitchen hood system as direct makeup. Units configured with intake louver/hood, MERV 8 and 13 filter section, DX coil, Hot gas reheat coil and Electric coil, variable volume supply fan and discharge plenum.

- Cafeteria kitchen – 3,000 CFM
- Culinary Arts kitchen – 3,000 CFM

D3060.20 Return Air

Return air associated with AHU installations will be ducted from the space served to the AHU.

Return air associated with DOAS units will be ducted from the zones served through the use of exhaust VAV boxes. The exhaust VAVs for classroom wings, as well as Administration and Guidance areas, shall be sized to provide zone return, not dedicated to individual rooms. For zones with common restrooms, dedicated exhaust VAVs will be provided to support the restrooms. The VAV boxes will be controlled to track the operation of the supply VAV boxes to maintain the building pressurization as positive (0.01 – 0.05" w.g.).

D3060.90 Ventilation Supplementary Components

Cafeteria Kitchen: A dedicated, roof-mounted upblast grease-type exhaust fan (6,000 cfm) will provide kitchen hood exhaust.

Culinary Art Kitchen: A dedicated, roof-mounted upblast grease-type exhaust fan (7,000 cfm) will provide kitchen hood exhaust.

Kiln: A dedicated exhaust fan (500 cfm) will be located on the roof. A stainless steel canopy hood will be provided for heat and odor capture above the kiln.

Labs: The D-Wing labs are provided with fume hoods and will be served by a packaged rooftop air handling unit with high-plume lab exhaust and an air-source heat pump makeup air unit with shared heat pipe section for heat recovery. The unit will be sized at 5,000 cfm and will support the Science and Prep rooms on both floors.

DOAS and Air Handling Units: All supply and return mains to/from units will include duct mounted sound attenuators.

Makeup Air Units: All supply mains from units will include duct mounted sound attenuators.

The air systems testing, adjusting and balancing will be performed by an Air Balancing Contractor certified by either Associated Air Balance Council (AABC), or National Environmental Balancing Bureau (NEBB).

D3090 Automatic Temperature Controls

The building management system will be based on a StruxureWare DDC system (by Schneider Electric) to match the current system used town-wide in East Longmeadow. The system shall provide control, monitoring, alarming and trending of the proposed HVAC systems through the building ethernet network. A graphic user interface will provide representations of the systems and equipment, accessible through the site operator workstation and through web interface.

Equipment with packaged controls shall interface with the proposed BMS through BACnet communications bus connections. BACnet/IP is a preferred alternative to BACnet MSTP.

The kitchen ventilation system will be controlled through a Demand Controlled Ventilation system.

The system will support monitoring of third-party systems associated with Plumbing and Electrical installations, including:

- Emergency Generator
- Lighting Control System
- Plug Load Management System
- Electric submeters (part of Measurement and Verification)
- DHW Heaters
- Water meters

- DHW Mixing Valves
- DHW Recirculation Pumps
- Water and Electric Meters will be trended and totalized as part of the proposed Measurement and Verification plan, which will comply with LEEDv4.
- Sanitary Pump Station (for concession building)

D SERVICES

D40 FIRE-PROTECTION

Codes and Standards:

780 CMR, 10th edition (based on 2021 IBC with Massachusetts amendments).

527 CMR: Board of Fire Prevention Regulations (based on NFPA 1, 2021 edition with Massachusetts amendments).

NFPA codes and regulations

D4010 Fire Suppression

D4010.10 Water-Based Fire-Suppression

Wet-Pipe Fire Sprinkler System:

The facility will be protected throughout with an automatic wet sprinkler system. A new 8-inch fire protection main will be extended from Maple Street onto the site. A fire protection loop will be installed around the building with a new 6-inch service entering the school at a perimeter water/fire service room. The system will also include wet alarm valve assemblies and/or floor control valve assemblies serving each of the sprinkler zones.

The sprinkler system will be separated into multiple zones per floor for the purposes of monitoring water flow. Six zones are anticipated. These consist of four zones for the first floor, and two for the second floor. For the first floor, the zones will be broken out with the auditorium wing, the gymnasium wing, and the two classroom wings all having its own floor control valve. The second floor zones will consist of two classroom wing zones. The floor control valve arrangements for parts D and E will be located within a small water room in part D.

Light Hazard areas will include: Office areas, general classrooms, auditorium, computer labs, commons, library and cafeteria seating. These systems will be designed with a density of 0.10 gpm/sf over 1500 square feet. The maximum sprinkler spacing is 15' x 15' (225 square feet). Calculations will include an exterior 100 gpm hose stream.

Ordinary Hazard Group 1 areas will include: Storage areas, mechanical rooms, gymnasium, kitchen food prep, science rooms, data and electrical rooms. Ordinary Hazard classification areas shall be protected at a rate of 0.15 GPM per square foot over the hydraulically remote 1,500 square feet. The maximum sprinkler spacing is 10 feet by 13 feet (130 sf). The hose stream allowance is 250 gpm (combined inside and outside hose).

Ordinary Hazard Group 2 areas will include the stage and any heavy shop classrooms. These areas will be designed for 0.20 gpm/sf over 1,500 square feet. The maximum coverage per sprinkler is 130 square feet (10'x13'). The hose stream allowance is 250 gpm (combined inside and outside hose).

Areas of the building that will not be provided with wet sprinkler protection are:

- Areas above suspended ceilings (noncombustible concealed spaces)
- Main Electrical Room
- Elevator shafts and pits
- Elevator machine rooms
- Emergency electrical closets

Sprinklers:

In areas with suspended acoustical ceiling or gypsum board ceiling, sprinklers will be concealed type with a white cover plate.

Provide custom color cover plates for areas with special or ornamental ceiling finishes.

In mechanical rooms, and other unfinished areas, sprinklers will be specified as exposed uprights, with a brass finish.

Sprinklers for areas subject to freezing shall be dry type, including but not limited to: Walk-in coolers and freezers.

D4010.20 Dry-Pipe Fire Sprinkler Systems

Areas subject to freezing will be provided with dry pipe sprinkler systems. Dry sprinkler systems will be provided throughout the receiving area and other areas that cannot be maintained above 40 degrees F.

Each system will include a dry alarm valve assembly and an air compressor sized to fill the system with air to 40 psi within 30 minutes.

D4010.50 Standpipes

Standpipes: The new school has full fire department access around the building. In addition, the highest occupied story is less than 30 feet above the lowest level of fire department access. Therefore, standpipes are not required by the building code. Coordination with the East Longmeadow Fire Department is required to confirm that fire department valves are not needed for typical fire-fighting operations.

D4010.80 Fire Protection Equipment

The fire suppression system will include a fire department connection at the fire service location. The fire department connection shall be flush-type Storz connections, with threads to match the East Longmeadow Fire Department standards. The Storz connection will be provided with a locking mechanism to prevent the hose from falling off.

A horizontal double check valve assembly will be provided on the new fire service. This device will be ASSE listed and Massachusetts State approved.

A wall indicator post valve will be provided outside the building, on the fire main. An alternate would be a post indicator valve.

D4010.90 Fire Suppression Supplementary Components

Fire Pump: A hydrant flow test was performed on April 5th, 2023. Two tests were performed. The first test included a gauge hydrant (#3070) and a flow hydrant (#3070) on Maple Street. The test resulted in a static pressure of 92 psi and a residual pressure of 88 psi while flowing 1030 gpm. The second test resulted in similar pressures (slight different for elevation) but the flowrate was only flowed 450 gpm. Based on the pressure/flow rate available, preliminary calculations show that a fire pump is not required. Final confirmation will be determined/confirmed detailed design.

Drains: Provide drain lines for the system main drains and sprinkler floor control valve assemblies. Where practical, drain lines will tie together in a common header. Drains and associated drain headers shall discharge to hub-drains, or to the exterior of the building.

D4030 Fire Protection Specialties

D4030.10 Roof Manifolds

Refer to the standpipe section of this specification. Since standpipes are not required, roof manifolds are not required. Final determination requires coordination with the East Longmeadow Fire department as roof manifolds may be desired for typical fire-fighting operations. If requested, the 100 psi minimum flow rate will be provided by the fire department through the fire department connection.

D4030.30 Fire Protection Cabinets and Extinguishers

Both sides of the stage will be provided with fire department hose connections. Since the building is equipped throughout with an automatic sprinkler system, the hose connections will consist of 1 1/2-inch hose connection installed in accordance with NFPA 13. Both valves will be installed within a fire hose cabinet. The requirement for hose and hose lengths will be coordinated with the East Longmeadow Fire Department.

Fire Extinguisher Cabinets: Fully-recessed cabinet; painted steel trim and door with full-glass panel, DSA glass. Baked enamel primer finish; field painted. Fire extinguishers and cabinets will be provided by the general contractor and located to meet the requirements of NFPA 10.

D4030.50 Wet Chemical Fire Extinguishing Systems

Wet chemical fire extinguishing systems will be provided at kitchen exhaust hoods by the kitchen equipment contractor. Ansul systems will be provided for the residential type ranges. Final coordination with fire department required.

D4040 Materials

D4040.10 Pipe and Fittings

Sprinkler piping 2" and smaller to be Schedule 40, black steel with black cast iron screwed fittings or roll-grooved joints..

Sprinkler piping 2-1/2" and larger to be Schedule 10 black steel pipe, roll grooved, with grooved end fittings. (Schedule 40 with grooved or threaded joints is also acceptable.)

D4040.20 Valves

Gate valves 2-1/2" and larger to be iron body, bronze mounted, taper wedge, outside screw and yoke, rising stem and flanged ends. Indicating valves to be butterfly type, bronze type with grooved ends. All shut-off valves to be FM approved type, and be equipped with supervisory tamper switches. These switches along with the flow switches shall be monitored by the building fire alarm system.

All test valves shall be at the remote ends of the systems to facilitate system flushing.

D SERVICES

D50 ELECTRICAL

D5010 Codes and Standards

527 CMR 12.00 - National Electrical Code NFPA 70 2023 with the Massachusetts amendments

National Fire Alarm and Signaling Code NFPA 72 2022

780 CMR 10th Edition - International Building Code 2021 with Massachusetts Stretch Code amendments

225 CMR 23.00 - International Energy Conservation Code IECC 2021 with Massachusetts Amendments

D5020 Electrical Service and Distribution

D5020.10 Electrical Service

Currently, there are (4) four total individual electrical services provided by the local Utility Co., National Grid and terminated in the school area. These electrical services support the following: existing school building itself, existing tennis court loads, existing stadium loads, and existing stadium scoreboard.

Existing School Building Electrical Service

The service originates at existing utility pole on Maple Street, extends overhead via one utility pole along the school's access road, and continues undergrounds towards the existing pad-mounted transformer, owned and maintained by National Grid. The transformer has a 277/480v 3ph 4w secondary voltage configuration. The transformer's secondary feeder runs underground towards the school building and terminates in the Main Electric room's 1,200 Amp 277/480v 3ph 4w Main Distribution panel. This existing electrical service will remain energized until the new school building is constructed, and the new school building's electrical service is activated, and then shall be disconnected and removed entirely with associated pad-mounted transformer and primary/secondary feeders.

New School Building Electrical Service

The new school building service will be provided by National Grid, as adequate to accommodate the new school building program.

The new electrical service will originate at the existing utility pole on Maple Street and will extend towards the new pad-mounted transformer via a new utility pole, provided by the utility company, and then via an underground duct bank provided by the Contractor. The primary duct bank will consist of (2)-4-inch concrete-encased PVC conduits installed per National Grid standards.

The utility company will provide the primary service feeder cable from the existing utility pole to the pad-mounted transformer, including terminations on both ends.

The new electrical transformer will be furnished, installed, owned and maintained by National Grid. It will be adjacent to the school building, near the Main Electric room.

The transformer will be of the pad-mounted type with primary voltage rating to match the utility company distribution voltage in the area, and secondary voltage configuration of 277/480 volts 3ph 4w. The transformer will be sized by National Grid based on "connected" and "demand" loads data provided by SMMA engineers.

Concrete pad and grounding for the new pad-mounted transformer will be provided by the Contractor per the utility company standards.

Transformer's secondary service feeder of the copper conductors will be installed by the Contractor via the underground concrete-encased PVC conduits from the pad-mounted transformer to a pad-mounted Transclosure Cabinet, serving as a Point of Interconnection (POI) between the utility service, the photovoltaic system components (the PV system Switchboard and Battery Storage), and the new school Main Switchboard.

The utility service will be metered at the transformer's secondary feeder side. The utility metering CTs will be installed under transformer's enclosure, and utility meter will be installed per National Grid's standards.

Pre-cast concrete manholes will be provided by the Contractor along the primary underground duct banks' routing in quantities, size/types as requested by National Grid.

Existing Tennis Court Electrical Service

Existing 200 Amp 120/240v 1 phase 3 wire utility service wiring with associated metering arrangement, power distribution/controls equipment and branch wiring to tennis court lights will be modified to accommodate the new site layout, as outlined in electrical drawings.

Existing Stadium Electrical Service

Existing 600 Amp 120/240v 1 phase 3 wire utility service wiring with associated metering arrangement, power distribution/controls equipment, branch wiring to stadium lights and wiring to other stadium loads will be modified to accommodate the new site layout, as outlined in electrical drawings.

Existing Stadium Scoreboard Electrical Service

Existing 200 Amp 120/240v 1 phase 3 wire utility service wiring with associated metering equipment will be modified to accommodate the new site layout, as outlined in electrical drawings.

Communication services

Along with the new school building electrical service, (4)-4-inch conduits for communication service providers' use will be installed by the Contractor. Conduits will

originate at a new utility pole, designated for communications, then will extend towards the new school building via an underground concrete-encased duct bank and will terminate in the school's MDF room. Separation between the electrical and communication conduits shall be at least 12 inches.

Pre-cast concrete manholes sized per service providers' standards will be provided along the duct banks in quantities as required for service cable field installation.

D5020.20 New School Building Electrical Design Load

The New School building connected electrical load estimate is based on preliminary building systems design:

Location	Load
Exterior Lighting	20 KVA
Interior Lighting @ <0.5W/SF	95 KVA
Computer and Convenience Power @ 1W/SF	190 KVA
Heating/Air-Conditioning, Ventilation, all electric @ 7.5VA/SF	1,430 KVA
Plumbing equipment, all electric	250 KVA
Kitchen, all electric	300 KVA
Miscellaneous Loads	110 KVA
Elevator, 30HP	30 KVA
Future pool loads (allocated as "future" provisions only)	350 KVA
EV Dual Charging Stations, (5) initial and (19) additional as "provisions for future EV" connections	125 KVA
Auditorium Theatrical LED Lighting	30 KVA
Telephone/Data systems: IDF/MDF/Server room equipment	40 KVA
PA, Security and Fire Alarm systems	20 KVA
Outdoor Scoreboards, Pitching machines, etc.	25 KVA
Total Connected Load	3,015 KVA

The **Total Demand Load**, assuming the **non-simultaneous equipment operation**, can be estimated approximately as follows: 60% of Kitchen Equipment, 100% of Interior and Exterior Lighting and approximately 75% of the remaining Connected Loads - **2,250 KVA**, or 2,700 Amp at 277/480 volts 3 phase 4 wire power system.

A 4,000 Amp 277/480V 3 phase 4 wire Main Switchboard equipped with a 3,000 Amp 100% rated Main Circuit Breaker (MCB) will be provided.

The recommended size of the pad-mounted transformer supplied by the National Grid is 2,500 KVA or larger. Projected new building loads will be submitted for evaluation to the National Grid Customer Department, and the new outdoor transformer will be sized/supplied by the National Grid based on their own calculations, standards and protocols.

D5020.30 Main Electrical Service Equipment

Main Electrical Switchboard: Fully metal enclosed, dead front, front- and rear- aligned, front- accessible only, NEMA1 indoor type, in compliance with UL 891, with a main protective device, and the distribution sections for the feeder protective devices. Switchboard sections will be designed for placement against a wall.

The switchboard bus will be rated for 4,000 Amps at 480Y/277 volts, three phase, four wire, and will be provided with tin-plated aluminum phase and neutral bus bars, and copper equipment ground bus.

Main protective device (MCB) will be an insulated-case circuit breaker (ICCB), individually fixed mounted, 3,000 Amp, 100% rated, with a solid-state trip unit capable of adjusting long time, short time, and ground fault protection characteristics. The switchboard will include an arc energy reduction maintenance switch (ARMS) with a local indicator for a main circuit breaker.

Feeder protective devices will be thermal-magnetic type molded case circuit breakers, but an electronic trip will be furnished for the devices 250 Amp and larger.

The switchboard will be furnished with a service entrance transient voltage surge protection device (SPD) rated 240 kA and digital metering unit to monitor voltage, current, power factor, demand kW and with a data communication port for interface with DDC (BMS).

The main switchboard's short circuit rating will be coordinated with National Grid, but preliminary it is estimated to be 65 KAIC.

D5020.40 Power Distribution

Electrical power distribution equipment will be installed in the Main Electric room, Emergency room, and in the downstream electric rooms and closets, as outlined on preliminary Power One-Line Diagram and architectural floor plans.

Electrical power distribution equipment will support the building interior and exterior loads including lighting, "small power" loads, kitchen equipment, mechanical and other loads in respective building areas and outdoor loads associated with the school. "Normal" or "Standby" power source will be supplied to loads from respective electrical panels based on their "critical" status (e.g.: all heating system equipment associated with the building "freeze control" will be powered by the "Standby" power source).

The Main Electric room will house the Main Switchboard, the 277/480 volts 3 phase 4 wire Power Distribution and "Mechanical" panels, the 277/480 volts 3 phase 4 wire Lighting panels, and the 120/208 volts 3 phase 4 wire double-tub MCB "small power" panels wired via associated dry-type transformers. Additionally, there will be transformers supplying power to the kitchen panel and Auditorium "Performance Lighting" Dimmer cabinets.

Typical downstream electric rooms will house the "Normal" and "Standby" 277/480 volts 3 phase 4 wire Power Distribution panels, "Mechanical" panels, Lighting panels, and 120/208 volts 3 phase 4 wire double-tub "Small power" panels wired via associated step-down dry-type transformers.

Dedicated receptacle panelboards will be equipped with SPD devices with surge current ratings of 80 kA per mode. K-rated transformers with electrostatic shielding are required to accommodate operation of the electronic/computer equipment in the office areas. The SPD devices will be also provided for panels supporting “emergency Life-safety” loads.

Gym equipment (basketball backboard operators, shot clocks, scoreboards, electrically operated divider curtain, etc.), Auditorium stage equipment, motorized window treatments, door operators, A/V equipment, etc. will be powered from electrical panels installed in respective areas.

Kitchen refrigeration equipment will be power fed from “Emergency Standby” power panels. Emergency Power Off (EPO) button will be provided for emergency power off function. The kitchen panel MCB will be equipped with shunt trip and tied to the kitchen fire suppression system control panel.

“Critical” loads such as sewage pump station, heating system equipment, HVAC serving the IDF/MDF rooms, elevator, etc. will be power fed from “Emergency Standby” power panels.

Five (5) EV Dual charger stations will be furnished and installed at designated spots of the parking lot. They will be wired to the school power distribution system. Additionally, power for nineteen (19) “future” EV Dual charger stations will be provided from the school power distribution system and shall be terminated in in-ground handholes at designated spots of the parking lot.

Power monitoring system will be provided and arranged such that in addition to monitoring the entire building utility service, the “normal” and “emergency” lighting systems, plug-in loads and large pieces of mechanical equipment located indoor and outdoor could be sub-metered individually and/or by building areas. Power sub-meters recording consumption and demand values will be tied into the building DDC system for monitoring. Sub-meters will be provided for all individual energy end uses that represent 10% or more of the total annual consumption of the building.

The infrastructure will be provided to take advantage in future of the Utility Co Demand Response programs or dynamic, real-time pricing program. A comprehensive plan for shedding at least 10% of the building estimated peak electricity demand will be developed.

Proposed manufacturers for the electrical power distribution equipment are: General Electric, Square D, Cutler-Hammer and Siemens.

D5020.70 Grounding

All exposed, non-current carrying metallic parts of electrical equipment, the raceway system, and the neutral conductor of the wiring system will be grounded in accordance with the Electrical Code.

A ground bus will be provided in the Main Electric room. It shall terminate electric service grounding conductor to the main switchboard ground bus, grounding electrode

conductors to the water service pipe and building structural steel, and a conductor to the ground bus in the communication closet.

Separate copper equipment grounding conductor with green outer jacket will be installed with all feeder and branch circuits.

Grounding cable connections to structural steel, grounding rods and other grounding cables will be of the thermal fusion type. Grounding rods will be copper clad steel, 5/8-inch diameter.

D5020.90 Interior Electrical Dry-type Transformers

Interior electrical dry-type transformers shall be provided to reduce 480 volts, three phase interior distribution voltage to 208Y/120 volts for small equipment power requirements and convenience outlets. Transformers shall be general purpose dry type, air cooled, with indoor ventilated steel enclosure, energy efficient and shall comply with NEMA standard ST 20 and TP-1. Where required to accommodate computer equipment and other non-linear type loads, the transformers shall be K-13 factor rated, and be provided with an electrostatic shielding.

D5030 General Purpose Electrical Power

D5030.10 Branch Wiring System

Electrical Branch Wiring: In general, wiring will be insulated conductors installed in metal conduit or metallic tubing run concealed in the finished areas or exposed in the unfinished areas such as mechanical and electric rooms. Minimum conduit size will be 3/4 inch.

Metal clad MC type cable may be used for branch circuit wiring above suspended ceiling and in dry wall partitions. MC type cable shall not be used for the branch circuit homeruns. MC type cable shall not be installed exposed in unfinished areas such as a penthouse, utility and electric rooms.

All conductors smaller than 150 Amp will be copper, 75 degree C insulation, type XHHW or THHN/THWN rated 600 volts. The minimum wire size for power and lighting circuits will be # 12 AWG. Control wiring conductors will be # 14 AWG. Conductors rated 150 Amp and larger shall be aluminum.

Underground conduits or conduits installed under concrete slab shall be PVC Schedule 40. Conduits exposed to weather will be rigid steel and painted.

D5030.50 Wiring Devices

Duplex receptacles will be heavy duty, specification grade, grounding type, rated 20 Amp at 120 volts, UL listed. Duplex receptacles will be of ground-fault type (GFCI) and weather-proof (WP) types where required by the Code. Tamper resistant type will be provided in all educational and common areas accessible by students.

Quantity of the duplex receptacles in the classrooms, labs, Gym, Media center, Art rooms, Music rooms, offices and other spaces will be as required by the specific area programs.

A minimum of 50% of receptacles (“plug-in loads”) will be controlled by local occupancy sensors or by an automatic time-scheduled control system. Dedicated “NC” Non-Controlled receptacles will be provided to accommodate uninterrupted power only to “critical” loads and equipment such as laptop charging stations and IT/MDF equipment.

Convenience outlets will be installed in the corridors and other common areas with spacing up to 50 ft.

The quantity and type of receptacles in the kitchen will be determined by the kitchen equipment design.

Toggle switches will be 20 Amp at 120/277 volts, specification grade, UL listed.

Floor boxes with the duplex receptacles and data jacks may be utilized if required to provide services to the stations in the open areas (Media Center, Art, etc.).

Two-compartment surface-mounted metal raceways (equal to Wiremold 4000) will be installed in the areas where a high density of the receptacles and data outlets is required.

D5030.90 General Purpose Electrical Power Supplementary Components

Motor Controls: Motor control centers and/or individually enclosed combination motor starter/disconnect switches will be provided for the control and overload protection of three-phase motors as required by Massachusetts Electrical Code 527 CMR. Motor starters will be magnetic type and have overload relays in each phase for three phase motors, hand-off-automatic selector switch, and control power transformer. Motor starters will comply with ANSI and NEMA standards.

Enclosed Safety Switches: Individual heavy-duty type switches in NEMA 1 for indoor and NEMA 3R for outdoor applications will be provided where equipment disconnecting means are required in accordance with 527 CMR, Massachusetts Electrical Code.

Electrical Branch Circuit Panelboards: Electrical branch circuit panelboards will be dead-front type with thermal-magnetic molded case circuit breakers. Panelboards will be provided with tin-plated phase and neutral buses, and copper equipment ground buses. Neutral buses rated 200% shall be specified for the panelboards where substantial non-linear type loads are present. Panelboards will be rated 480y/277 volts, three phase, four wire for power and lighting loads and 208y/120 volts, three phase, four wire for small power and convenience outlets. All panelboards will be Underwriters Laboratories (UL) listed and labeled and comply with NEMA standard PB1 for panelboards.

D5040 Lighting

D5040.10 Lighting Control

Wireless type dimming and multi-scene lighting control stations will be provided throughout for local means of controls. The manual means of controls will be supplemented with automatic controls, consisting of occupancy sensors, photocells (daylight sensors) and the wireless networked digital time-programmable lighting control system, as applicable to specific building areas.

Classrooms, labs, administration offices, conference rooms, bathrooms, storage rooms, teacher rooms and similar spaces will be equipped with occupancy sensors and photocells.

For the building areas without occupancy sensors control, the wireless networked digital time-programmable lighting control system will facilitate automatic lighting shutoff on a scheduled basis with an occupant override.

Dedicated emergency egress lights will be controlled via the programmable lighting control system with an “emergency by-pass” arrangement. These lights will turn OFF during unoccupied hours, however, irrespective of their “on-off” status, they will turn ON automatically during the utility power loss event, or upon the building fire and security alarm systems activation.

Lighting control system will be designed and installed in compliance with the referenced International Energy Conservation Code and LEED for Schools requirements.

The lighting control system will be tied into the building DDC (BMS) system.

D5040.50 Lighting Fixtures

PROPOSED ILLUMINATION LEVELS

Location	Average Illumination Levels
Classrooms and Labs	35-45 FC
Offices, Conference Rooms, Media Center	35-45 FC
Kitchen	40-50 FC
Gymnasium	45-50 FC
Dining	30-40 FC
Corridors	20-25 FC
Utility and Storage Rooms	20-25 FC

The intent of the lighting design is to provide a visual environment for the students and faculty that is supportive of the educational activities within the building. The lighting system will be designed in compliance with the applicable ICC 2021 with Massachusetts Amendments Energy Code and potentially be eligible for the Utility Co, National Grid’s rebate program.

Interior lighting illumination levels will meet the IESNA recommended values for applicable activity type and will comply with the referenced International Energy Conservation Code energy allowances and control requirements.

In general, lighting design will incorporate high-efficiency interior lighting fixtures. LED linear fixtures, LED downlights and LED decorative lights will be provided throughout.

Lighting in classroom, labs and similar educational spaces: continuous rows of the direct/indirect pendant mounted LED fixtures, supplemented with the teacher wall-mounted linear LED fixtures where appropriate, controlled by the local dimmers and/or switches and wired via occupancy sensors. In addition, ambient daylight sensors will be provided for automatic dimming control of light fixtures located adjacent to the exterior windows.

Lighting in the administration area offices, teacher support areas, and in the similar areas will be LED recessed 2' x 2' and 2' x 4' of the direct/indirect type, gradually dimmed or multi-switched, controlled by local dimmers and/or switches, wired via occupancy sensors and daylight sensors, where applicable.

Corridor lighting fixtures will be linear recessed LED fixtures 6" x 4' and 6" x 6', supplemented by the LED downlights. Stairways will mostly have wall mounted LED linear lights.

The lighting in the kitchen, servery and culinary will be LED 2' x 2' and 2' x 4' with prismatic lens.

Gym lighting will include a grid of pendant mounted round LED lights, controlled by local switches and occupancy sensors. In addition, ambient daylight sensors will be provided to control fixtures located adjacent to the exterior windows.

Lighting in the Cafeteria, Media Center, and LGI will be a combination of LED pendants and ceiling recessed LED downlights, supplemented with wall-mounted LED sconces where applicable. These fixtures will be provided with dimmers and/or switches. In addition, ambient daylight sensors will be provided to control fixtures located adjacent to the exterior windows.

The auditorium will be equipped with a dedicated Theatrical Lighting system allowing for performances and lecture presentations. The system will consist of lighting dimmer cabinets, performance type track-mounted LED multi-color lights located in front of and at the stage, "house" lights above the seating area, and dimming and multi-scene pre-set stations. A separate set of "general use" LED lights will be provided at the stage for "maintenance" tasks operated on a separate manual control.

The overall lighting design goal is to achieve the LPD (Lighting Power Density) of 0.5W/SF or less.

All interior lights will be controlled by a networked digital time-programmable lighting control system, occupancy sensors and photocells (daylight sensors), as applicable.

Exit signs and egress lighting will be connected to the emergency power distribution system to provide illumination level required by Code for emergency egress in a case of normal power failure.

Lighting system and controls will comply with the requirements of Massachusetts Building Code, Chapter 13 Energy Conservation.

D5040.90 Exterior Lighting

The new energy-efficient exterior lighting system will consist of building-mounted lighting fixtures at egress doors and pole-mounted lights for parking lots, roadways and walkways. All exterior fixtures will be vandal resistant, enclosed, listed for wet locations and with full cut-off light distribution.

Pole-mounted lights will be of dimmable LED type with house side optics as appropriate for installation adjacent to property lines. The fixtures mounting heights, types and locations will be selected to avoid glare and light spillover beyond the property line.

Building-mounted lighting fixtures will be of dimmable LED type and will be wired to emergency generator power system.

Site lighting system for parking lots and roadways will provide a minimum maintained lighting level 0.5 FC at grade level, and 1FC minimum maintained for walkways.

The system will comply with energy use limitations per Massachusetts Building Code and referenced International Energy Conservation Code. Light fixtures and lighting levels will be designed in accordance with IESNA recommendations, in compliance with East Longmeadow zoning by-laws and v4 LEED for Schools requirements, including Reduced Energy and Light Pollution credits.

All exterior lights will be controlled by the new networked programmable lighting control system and a photocell for additional energy savings.

Exterior lighting will be tied into the building DDC (BMS) system for monitoring and time schedule overrides.

D5060 Power Generation

D5060.10 Packaged Generator Assemblies

The generator power system has been sized to support emergency (life safety) and standby building loads.

1. Emergency Life-safety power loads, as required by the Code:

Emergency egress lighting (interior and building exterior at exit doors) - 50 KVA

Fire alarm system and BDA communication system - 5 KVA

2. Emergency Standby power loads:

Limited lighting and small power in administration offices and nurse/medical area, and dedicated bathrooms - 15 KVA

Heating system equipment associated with building freeze prevention in all building areas, on selective controls - 450 KVA

Cooling system equipment associated with IDF/MDF/electric rooms - 50 KVA

Kitchen refrigeration equipment - 80 KVA

Refrigeration equipment outside of the kitchen – 20 KVA

Elevator power, lighting and controls - 35 KVA

Sewage ejection, sump pumps with controls, heat trace, etc. – 25 KVA

Water service booster, if required – 10 KVA

Communication system equipment (main equipment/computer servers, PA, telephone, selected wireless access points) – 25 KVA
Building DDC (BMS) system control panels – 3 KVA
Security system equipment – 2 KVA

Packaged Engine Generator Systems

A new packaged diesel engine-generator system will be provided to supply power to emergency life-safety and standby loads upon loss of the normal electric utility power source. The generator unit will start automatically on loss of normal utility power and transfer to the emergency power system within 10 seconds.

Based on the preliminary estimated load data, the generator system shall be rated 900kW/1,125kVA at 277/480 volts 3 phase, the final size will be finalized in subsequent design phase. The unit will be furnished in an outdoor weather protective and soundproof enclosure.

A skid-based fuel tank will be sized for 24 hours of the generator operation without re-fueling. The fuel tank shall be of double-wall construction and will be furnished with a leak detection system.

The generator power system will include two Automatic Transfer Switches (ATS) and the associated power distribution panels. Emergency ATS#1 for the “life safety” loads will be rated 150 Amp, and emergency “Standby” ATS#2 will be rated 1,200 Amp, preliminary.

“Emergency Life Safety” power distribution equipment including ATS #1 and panels will be installed in 2-hour fire-rated closets in compliance with the requirements of 527 CMR, Massachusetts Electrical Code.

The “life-safety” ATS#1 and associated 277/480 volts 3 phase distribution panel, a 277/480 volts 3 phase lighting panel, and a 120/208 volt “small power” panel will be in the Main Emergency room, located adjacent to the Main Electric room.

ATS#2 and associated 277/480 volts 3 phase distribution panel, a 277/480 volts 3 phase lighting panel, and a double-tub 120/208 volts panel will be in the Main Electric room.

Satellite “life safety” panels will be installed either in dedicated 2-hour fire-rated emergency closets or in downstream “emergency/normal” electric rooms with 2-hour fire-rated walls and floor/ceilings (design to be finalized in subsequent design phase).

“Emergency life safety” system feeders shall be installed in 2-hour fire-rated enclosures or installed underground, otherwise shall be using MI cable in accordance with requirements of Code.

D5060.20 Photovoltaic System

The roof-mounted PV system is preliminary estimated at 450 KWAC.

Strings of individual 300W PV panel modules and power optimizers will be connected to 3 phase DC to AC PV inverters in NEMA 3R housings with integrated DC disconnects. There will be approximately (15) fifteen 33.3 kW each or (10) ten 50-62.5 kW each indoor or roof-mounted PV inverters (locations, size and quantity of inverters to be finalized). The roof-mounted PV support system (if this option is selected) shall be a ballasted type. An outdoor pad-mounted battery storage will be installed to support this system.

The PV inverters will be wired to an appropriate number of circuit breakers in a dedicated outdoor pad-mounted multi-section PV Switchboard. The PV Switchboard will be 1,000 Amp 277/480V, 3 phase, 4 wire (design to be finalized), with bus rating per NEC requirements.

The system shall be separately metered and interconnected with the utility transformer via the transclosure cabinet (design to be finalized), refer to Section D5020.10.

D5080 Miscellaneous Electrical Systems

D5080.10 Lightning Protection

The lightning protection system shall be designed and installed in accordance with NFPA 780, Standard for Installation of Lightning Protection Systems. The system shall consist of roof mounted copper air terminals, grounding conductors, down leads, ground rods and bonding conductors. Upon completion, the system shall be provided with an Underwriters Laboratories (UL) Label.

D5080.20 Electric Vehicle (EV) Charging Stations

Electric Vehicle charging stations will be provided at specific locations within the parking lot. EV chargers will be Level 2 type, 208 volts single phase input with an output rating of 6.6 kW. The chargers will be bollard-style mounts and capable of powering two vehicles at once, via a shared power controller. Five (5) dual charging stations, capable of charging up to ten (10) vehicles simultaneously, will be in the parking lot, connected and fully operational. Power for an additional nineteen (19) "future" EV dual charging stations will be roughed in to site and wiring will be terminated at in-ground handholes.

D5080.30 Low-Emitting Materials

All solvents and adhesives will be specified to meet test standards of Indoor Advantage Gold or GreenGuard Children and Schools.

D5090 Commissioning

The following electrical systems will be commissioned, including all equipment, installation, operation and controls, programming, integration with other systems and monitoring:

- Electrical distribution system consisting of the switchboard, distribution panels, power & lighting panels
- Lightning Protection and Grounding systems
- Lighting system
- Networked Lighting Control system
- Power usage metering and monitoring system
- Fire Alarm system
- Generator Set and Transfer switches

D SERVICES**D60 COMMUNICATIONS****D6010 Voice and Data Communications Infrastructure****D6020.10 Voice Communications Switching and Routing Equipment**

A voice and data distribution system will provide connectivity from the area voice/data outlets to their respective communication rooms. Backbone cables connectivity will be provided from the each closet to the main communication room. Wiring, outlets and terminations will be installed to comply with EIA/TIA 568 standards.

System program requirements and design shall be developed by the Communication Consultant. It shall include the specification for data/voice system including recommended equipment, jacks, installation and wiring requirements. Power requirements in watt per sq. ft. for the communication closets shall be determined by Communication Consultant.

The voice and data distribution system shall consist of Category 6A structured unshielded twisted pair (UTP) cabling systems and outlets for local area network (LAN) and voice communications. Outlets shall be provided in the offices, classrooms, workrooms, library, computer labs, gymnasium, auditorium, natatorium, designated outdoor locations, and electrical and mechanical rooms.

Underground duct bank of four 4-inch conduits will run from the Telecommunications Service Provider riser pole on Maple Street to the demarcation location in the building's main communication room. The existing town fiber optic underground cable path that currently passes through the site for the new building will be intercepted and temporarily rerouted overhead to maintain service to the existing high school. During construction, a permanent underground infrastructure will be installed to run the town fiber optic cable to the new building. Auxiliary Telecommunications Rooms will be located throughout the building keep the maximum length of horizontal distribution cabling to workstation outlets within the industry standard of 100-meters. The Telecommunications Rooms will be connected with the main Telecommunications Equipment Room (TER) using fiber optic and multi-pair copper backbone cables.

Network switches, wireless access points and a VoIP (voice over IP) telephone that includes the VoIP head end and handsets distributed throughout the building will be purchased and installed under the Technology Equipment budget using State Contract vendors. The equipment will be specified, purchased and installed over the course of the final year of construction and prior to occupancy. This approach ensures that the school will be equipped with the most current components on day one.

D6030 Audio-Video Communication

D6030.10 Audiovisual Systems

The Auditorium will be equipped with an audiovisual system including a video projection system to support presentations and performances. The Auditorium will include wired and wireless microphones, digital audio mixing and recording, audiovisual signal routing and switching, permanent and portable loudspeakers, touch panel controls, flexible signal routing, an assistive listening system per ADA requirements, an audio and video monitoring system for off stage cueing, and headphone intercom equipment for stage crew communications.

The Cafeteria will be equipped with a sound system with wireless microphones, media players inputs, and overhead loudspeakers and large LED wall digital display, approximately 100" x 160".

The Gymnasium will be equipped with an audio system with wireless microphones, rolling equipment rack for scorer table, media player inputs, video camera ports, permanent overhead loudspeakers, and an assistive listening system per ADA requirements.

The Large Group Instruction room will be equipped with wireless microphones, with three 86" flat screen monitors, audiovisual signal routing and switching, a button panel controller, permanent overhead loudspeakers, and an assistive listening system. This sound system, provided under the base contract, will interface with the video display technology provided under the Technology Equipment package.

The Band and Chorus Classrooms will be equipped with sound systems with a hanging microphones, digital audio recording, high-quality audio playback, media player interface, and an assistive listening system. This sound system, provided under the base contract, will interface with the video display technology provided under the Technology Equipment package.

Classrooms, Learning Commons and Conference Rooms will be designed with power, data and conduit raceways to accommodate video display equipment and associated signal cabling. Displays and associated signal cabling will be purchased and installed under the Technology Equipment budget. Local sound systems in these spaces will be provided under the base building contract. Various locations in the corridors will present digital signage on flat screen monitors, provided by the base building contract.

All sound systems will be interfaced with the fire alarm and school-wide Public Address System in order to interrupt local sound in the event of an emergency or school announcements.

D6060 Distributed Communications And Monitoring

D6060.50 Distributed Systems

Clock and Program Systems: A clock and program system will be provided for originating and distributing time and time correction signals, and for programming and initiating audible program signals. System will consist of a master control unit, indicating clocks, and connections to the public address and music system. Master control unit will transmit time and time correction signals to all system clocks throughout

the building and generate program tone signals for broadcasting over all loudspeakers on the public address and music system.

Public Address (PA) System: An IP-Based PA System will be provided for transmitting announcements throughout the building. Classrooms and selected spaces will be equipped with two-way communications capability to allow Teachers and Administrators to communicate through classroom speakers or through classroom handsets. Corridors and larger spaces including the Gym and Dining Commons will have one-way Public Address capability. The PA system will be integrated with the Electronic Security System and VoIP Telephone System.

Distributed Antenna System: A Distributed Antenna system, with Bi-Directional Amplification will be provided if required to support public safety and School District radio communications. Decision will be based on performing a radio system survey and developing a signal heat map to assess building conditions prior to issuing construction documents.

Cellular Repeater System: A Cellular Repeater System will be considered to provide students and staff with reliable mobile access service throughout the building. Further discussion with the ELHS and ELPS Administration is required to confirm this system is within the overall project budget and desired.

D6090 Communications Supplementary Components

D6090.10 Supplementary Components

Security Access and Surveillance: Refer to Section D70, Electronic Safety and Security for a complete description.

D SERVICES**D70 ELECTRONIC SAFETY AND SECURITY****D7010 ELECTRONIC SECURITY MANAGEMENT SYSTEM**

The electronic security management system shall consist of the following subsystems as specified herein:

1. Electronic Surveillance
2. Electronic Access Control
3. Electronic Intrusion Detection
4. Gunshot Detection System
5. Security Communication System
6. Visitor Management System

The security system shall consist of a primary system server to manage the video surveillance cameras and recording, access control and intrusion alarms. Remotely distributed card access readers, control panels, zone controlling keypads, door position switches, motion detectors, duress and lockdown alarms shall serve to secure staff and monitor doors and interior spaces. All servers tie into a Regional Dispatch Center.

The system shall include graphical mapping allowing the end-user to quickly identify alarm conditions and lock/unlock doors.

The system shall transmit alarm signals to the District's security systems service provider upon detection of an unauthorized building entry.

The School Building Authority shall be requested to approve the following proprietary systems for the project:

1. Axis – Access Control System
2. Axis – Video Surveillance System
3. Axis Communications – IP Surveillance Cameras
4. Cisco – Network Equipment
5. Sonitrol – Intrusion Detection System

D7010.10 ELECTRONIC VIDEO SURVEILLANCE

An IP-based system shall be provided to perform fixed surveillance, assessment, license plate recognition, monitoring, and recording operations. The system shall be capable of integrated operations with other security-related systems such as the access control systems or alarm call-up and event assessment at all remote workstations.

The system consists of computer servers with management software, computer monitors and IP-based cameras. The video management server shall be rack mounted. The system can be accessed by authorized users from any computer within the school or externally via an IP address. The system shall allow for remote viewing and control by administration as well as remote visibility for the Police Department.

Camera coverage shall include corridors, stairwells, cafeteria, auditorium, gymnasium, building entrances, exterior building locations, site access roads, the bus drop-off area and parking lots. The final scope of the system and performance criteria shall be further defined.

D7010.20 NETWORK VIDEO RECORDER (NVR)

The NVR shall provide storage of all cameras using the following criteria:

1. 90-day video storage retention.
2. Interior cameras record on motion and exterior cameras record continuously.
3. All cameras using H.265 compression.
4. Interior fixed cameras: Record HDTV 1920x1080 with H.264 compression @ 15 images per second when motion is detected.
5. Exterior fixed cameras: Record HDTV 1920x1080 with H.264 compression @ 5 images per second when no motion is detected and 15 images/second when motion is detected.
6. Motion triggered recording
 - a. Assume that motion shall be detected 50% of the day.
 - b. Motion detection shall be configurable by camera and schedule to mitigate nuisance triggers.
 - c. Record video as specified herein when motion is detected.
 - d. Record video as specified herein when no motion is detected.

The cameras shall provide video surveillance, assessment, and visual alarm monitoring of selected interior and exterior access doors as well as other critical areas.

1. Cameras shall be IP based fixed and multi-lens cameras.
2. Cameras shall include infrared illumination.
3. Each camera can be viewed independently.

Exterior cameras shall have low light sensitivity, weatherproof housings and accessories for exterior conditions. Exterior cameras shall be mounted on light poles, building walls, corners or under building soffits. Exterior cameras shall have surge suppression.

D7010.30 ELECTRONIC ACCESS CONTROL

Access Control System: Fully integrated system, which shall include door controllers, card readers and audio/ video intercoms, electric locking devices, request to exit switches, door release buttons, electromagnetic door holders, lockdown buttons, audible alarms, automatic door operators, lock power supplies, equipment enclosures, tamper switches, credentials, credential printers and credential cameras.

The system monitors and controls all access of the perimeter doors, including the front door.

Interface: The access control system shall interface with the video surveillance system, as well as card access, for select interior doors.

Card readers: Installed on doors requiring access control.

Duress Buttons: Installed at predetermined locations to alert emergency officials of any emergency. Each office shall have a button to alert the alarm monitoring company.

Electric Locking Devices: Electrified door hardware for card reader controlled doors shall include electrified locksets, electrified hinges, electric exit devices, and electric power transfers.

Request to Exit Devices (REX): The request to exit device shall shunt the alarm initiated from the door contact upon egress. Shunting of the alarm shall be accomplished by connection of the REX to an appropriate input on the field control panel. This input shall be programmed to shunt the door contact upon activation of the REX device.

Door Release Button: The door release button, when activated, shall trigger an event in the access control system, which shall unlock the associated door.

Electromagnetic Door Holder: Each electromagnetic door holder shall be configured to be de-magnetized upon activation of the lockdown button and intrusion detection system. Magnetization shall not occur until reset by either system.

Lockdown Button: The lockdown button, when activated, shall trigger an event in the access control system, which shall lock all electrified doors, disable the card readers and any door release functions and trigger exterior indicator beacons to illuminate. Cards of security personnel shall continue to work on the locked out readers during a lockdown situation. The lockdown button, when activated, shall cut power for electromagnetic door holding magnets. Magnets shall remain de-energized until reset.

D7010.40 ELECTRONIC INTRUSION DETECTION

The system consists of door position switches and motion detection in all main perimeter areas of the building.

This system shall be fully integrated with the access control system.

Motion Detectors: Shall be dual technology, combining a PIR and microwave sensor.

Door Position Switch (DPS): The DPS at card reader controlled locations serve to indicate the open/closed status of the associated door and shall establish the basis for reporting a door-propped or unauthorized entry condition.

D7010.50 SECURITY COMMUNICATION

The video intercom system shall be capable of having multiple control units and/or IP direct masters and video door stations.

All exterior communication equipment shall have lightning protection.

Installed separately from conventional general-purpose internal communications systems, the system shall be used as a video door entry system, emergency announcement system, rescue assistance system, urgent call system, public announcement system, and access control system as scheduled, indicated or required.

The system shall have the ability to roll over any video intercom door station call to any video intercom master station within the complete system. This system functionality shall be flexible and configurable by system programming and not rely upon physical wiring connections.

The system shall include remote door unlocking capability from the master station.

Shall include a full range of control unit functions, including basic conversation, shall be capable: call forwarding, scan monitoring, emergency call, priority call, video audio recording, paging, and zone paging as scheduled, indicated or required.

D7010.60 ELECTRONIC VISITOR MANAGEMENT

The system shall be used for recording and monitoring visitors.

The system shall include the software and associated equipment, including a workstation and printer for visitor sign-in and management.

The system shall provide the following functions:

1. Screen every visitor, including contractors, guardians, and volunteers against up-to-date U.S. sex offender databases.
2. Check visitors against custom school or district databases which can contain custodial restrictions and/or banned visitors.
3. Alert administrative and security personnel should a visitor be identified as a risk.
4. Print badges with the approved visitor's photo, name, date, time of entry, the building name, and visitor's destination.
5. Generate accurate, reliable district-wide and school-level reports with a complete sign-in history for every person entering your schools.

The system shall include the following equipment:

1. ID scanner for state issued identification cards.
2. Visitor Badges.
3. Camera.
4. Printer for visitor badges or student tardy passes.

D7010.70 GUNSHOT DETECTION SYSTEM

The gunshot detection system shall be installed throughout the school and alert when gunfire is detected inside the school.

The system shall immediately relay the shot location information through floor plan maps, and send text and e-mail notifications to key personnel including building administration, staff, and first responders with no required human interaction.

The system shall be integrated with the access control and video surveillance system to activate cameras in the area in order to give key personnel a visual overview of the event.

Police department integration shall be provided to send automated video feeds and mapping information of the incident direct to their mobile devices.

D7050 DETECTION AND ALARM

D7050.10 Fire Detection and Alarm

Addressable, non-coded, Class A supervised type fire detection and alarm system shall be provided to meet the requirements of the Massachusetts Building Code, NFPA-72, NFPA-90A, Americans with Disabilities Act, and local Fire Department requirements.

Fire alarm system shall consist of a Fire Alarm Control Panel (FACP) with microphone assembly, printer, LCD type remote annunciator(s), automatic smoke and heat detectors, manual pull stations, audible and visible alarm signals, connections to automatic fire suppression systems. The system shall transmit the trouble and alarm signals to monitoring Central Station approved by Fire Department via two dedicated telephone lines.

The system shall be as manufactured by FCI, Edwards (EST), Notifier or Simplex.

Fire alarm control panel shall provide an alarm and annunciation capability in case of activation of any manual fire alarm station, smoke detector, heat detector, duct smoke detector, sprinkler water flow switch or fire suppression system.

Audible (speakers) and visual (high intensity strobes) alarm devices shall be installed per NFPA-72.

Addressable type duct smoke detectors shall be installed in supply and return air ducts as required by NFPA-90A.

As a minimum, the system type smoke detectors shall be provided in the main electric room, downstream electric rooms and closets, data/telephone rooms, storage areas, corridors, elevator machine room, elevator lobbies and at the top of the stairways. Additional areas, specifically requested by the local Fire department to be equipped with automatic fire detection devices, shall be reviewed and finalized in subsequent design phases.

Fire suppression systems shall be tied to the fire alarm control panel.

E EQUIPMENT AND FURNISHINGS

E10 EQUIPMENT

E1010 Vehicle and Pedestrian Equipment

E1010.50 Loading Dock Equipment

Dock Bumpers: Heavy molded-rubber compound reinforced with nylon, rayon or polyester cord. Furnish units with predrilled anchor holes.

1. Configuration: Inverted L-shape; 18" high by 18" wide.
2. Thickness: 4 inches (100 mm)

Dock Levelers: 20,000 pound capacity, hydraulic leveler, as manufactured by Rite-Hite or Kelley.

E1010 Cubicle Curtains

Medical Suite: Curtain track and carrier (3)

Medically Fragile Classroom: Curtain track and carrier (3)

E1030 Commercial Equipment

E1030.80 Foodservice Equipment

Kitchen: A full kitchen will be provided to serve the Cafeteria capable of serving the 800 student population and serving an additional 450 meals per day to 2 district elementary schools. The kitchen will include a scramble serving area.

Refer to Conceptual Design Drawing and kitchen narrative and equipment.

Culinary/Family Consumer Science Classroom: 6 student kitchen stations and one teacher/demo kitchen area that will each include a range with oven and sink disposal. Additionally in the room: 1 reach in freezer, 2 reach in refrigerators, 1 industrial dishwasher (17" door), 3 microwave, 1 top loading washer, 1 top loading dryer.

E1040 Institutional Equipment

E1040.10 Educational and Scientific Equipment

Fume Hoods: Standard 6ft fume hoods (3 count); Double sided fume 6ft fume hood (1 count), Double sided 42 inch fume hood (1 counter); Standard 42 inch fume hood (3 count).

Biological Safety Cabinets (BSC's): Assume 1 cabinet per science lab (8 total)

Other Laboratory Equipment: Per Prep Room: 1 reach in refrigerator, 1 reach in freezer, 1 small ice machine, 1 domestic dish washer.

Chemical Storage Cabinets: Full-height metal storage cabinets for storage of flammable chemicals and acids; one of each type in each Science Prep Room.

Miscellaneous Equipment: Goggles sterilization cabinet, 1 per lab.

Nurse's Office: Reach in Fridge with Ice Maker and Medicine Lock Box

Related Work: See D20, Plumbing, for emergency eye-wash. See E20 for laboratory casework.

E1060 Residential Equipment

E1060.10 Residential Appliances

Microwaves:

- 1 countertop unit per each Teacher Planning Room (4 total)
- 1 countertop unit per District Offices kitchenette (1 total)

Dishwashers:

- 1 per each science prep room (4 total)

Washer/Dryer:

- 1 set in PE Storage
- 1 set in Kitchen
- 1 set in Life Skills
- 1 set in Life Skills 18-22
- 1 stacked set in Custodial

E1070 Entertainment and Recreational Equipment

E1070.10 Theater and Stage Equipment

E1070 Entertainment and Recreational Equipment

E1070.10 Theater and Stage Equipment

The Auditorium Stage will not include a traditional proscenium. It will include a main curtain and rear cyclorama.

See Audio-Visual Equipment, below for projection screen.

Adjustable Acoustics: Traverse curtains on fixed speed curtain machines

- Quantity: 8
- Curtains: 100% full IFR 25 ounce velour with UV protective lining
- Curtain track: B.O.D. H&H Specialties 401B fixed speed
- Curtain machine: B.O.D. H&H Specialties 459
- Controls: Simple open/close pushbuttons without preset ability

Theater Rigging: Track and curtain machine for one main draw curtain; one motorized cyclorama batten

- Curtain track: B.O.D. H&H Specialties 418PB
- Curtain machine: B.O.D. H&H Specialties 462VS-1 variable speed
- Controls: B.O.D. H&H Specialties 481VS
- Motorized cyclorama batten: B.O.D. ETC P800G fixed speed, 800 lb capacity
- Controls: Simple up/down pushbutton without preset ability

Stage Curtains:

- Main draw curtain: 100% full IFR 25 ounce velour with lining
- Rear cyclorama: Flame retardant treated bleached muslin, seamless

Theater Lighting Fixtures: Inventory of self-dimming, white and multicolor LED luminaires for stage illumination

- Theater Controls
- Source Four LED Series 3 Lustr profile

- Desire Fresnel
- SolaFrame Studio
- Source Four WRD PAR (worklight)
- Accessories

Basis of Design Products:

- Strand Aurora LED striplight
- Robert Juliat Oz - 600w Cool White LED followspot
- Related Accessories

Theater Lighting Controls: Integrated system providing control of all lighting (stage, architectural, and safety) within the Auditorium bounds

- Electronic Theatre Controls, Basis of Design
- Relay breaker panels: Sensor IQ
- Pass-through relay panels: Foundry Mini Panel
- Portable control desk: Ion Xe 20 - 12K

Architectural lighting controls:

- Unison Paradigm P-ACP Series processor, 7" Unison Paradigm touchscreen controllers, Unison Paradigm Inspire wall-mounted controls, Unison Paradigm occupancy sensors, UL-924 compliant emergency bypass devices
- Accessories

Other Products:

- Stage lighting power outlets
- Theater lighting Ethernet
- Lighting auxiliary control rack
- Accessories

Related Work:

- See Audio-Visual Equipment, below for projection screens.
- See D50, Electrical Work, for power and wiring to rigging, lighting and controls.
- See D50, Electrical Work, for auditorium sound system.

E1070.50 Athletic Equipment

Indoor Equipment in Gymnasium: The Gymnasium will be equipped so that it can be used for full-court basketball games utilizing the entire gymnasium, or for 2 practice games separated by a divider curtain.

Equipment to be provided:

- Electronic scoreboard for interior installation.
- Electronic shot timer.
- Basketball backboards, overhead mounted type, with glass backboards for main court (2) and wood backboards for practice courts (4)
- 6' Wall protection mats.
- Divider curtain.
- Volleyball posts and net, overhead mounted type (2 total)
- Mat hoist (1 per gym, 1 per Alt PE) Basis of Design: Draper 502021
- Batting cage (1)
- 24ft barre and mirror wall at Alt PE

Outdoor Athletic Equipment: Refer to Section G, Sitework.

Athletic Lockers: Refer to Section C1030, Fittings, for new athletic lockers and locker room benches.

E1070.80 Audiovisual Equipment

In the Auditorium

1. Wireless and Wired microphones (handheld and lapel)
2. Digital audio mixer
3. Distributed loudspeakers
4. Audio recording system
5. Production intercom
6. Large venue video projector and screen
7. Video and audio routing
8. Touch panel control system
9. Digital signal processing
10. Camera connection points

11. Equipment racks
12. Power amplifiers
13. Assistive listening system

In the Gymnasium

1. Wireless and Wired microphones (handheld and lapel)
2. Loudspeakers
3. Digital signal processing
4. Camera connection points
5. Video and audio routing
6. Touch panel control system
7. Power amplifiers
8. Equipment racks
9. Assistive listening system

In the Cafeteria

1. Wireless and Wired microphones (handheld and lapel)
2. Loudspeakers
3. Digital signal processing
4. Power amplifiers
5. Video wall
6. Equipment racks
7. Assistive listening system

In the Large Group Instruction Room

1. Wireless and Wired microphones (handheld and lapel)
2. Loudspeakers
3. Digital signal processing
4. Button panel controller

5. (3) 84" flat screens by IT EQ contract
6. Power amplifiers
7. Equipment racks
8. Assistive listening system

In the Band and Chorus Classrooms

1. Stereo recording microphone
2. Digital mixer with solid state recording
3. Loudspeakers
4. Power amplifier
5. Equipment rack
6. Assistive listening system

Projection Screens: Electrically operated screens with standard reflective fabric face; motor in roller. Screens will be provided at the following locations:

- In the Auditorium, on the stage.

LED Wall: Electrically operated synchronized flat screens will be provided at the following locations:

- In the Cafeteria, 7ft x 14 ft

E 1090.20

Ice Making Machines

- In Athletic Trainers Office (90lbs)
- In Science Prep Rooms (4 count, 50lbs each)

E20 FURNISHINGS

E2010 Fixed Furnishings

E2010.20 Window Treatments

Manual Light Filtering shades will be provided at all ext. window locations.

Manual Room Darkening Shades with Track at LGI and Science Labs.

Motorized Shades at Gymnasium, Auditorium and Cafeteria (west wall only)

Manually Operated Shades with Spring Rollers (Interior windows and doors)

Basis of Design: Draper Spring Roll Flex Shade

Manually Operated Shades with Single Rollers for Room Darkening

Basis of Design: Draper Manual FlexShade

Motor Operated Single Roller Shade

Basis of Design: Draper Inc. Motorized FlexShade

E2010.30 Casework

Classroom Casework: Plastic laminate clad casework fabricated to AWI (American Woodwork Institute) Custom Grade, flush overlay design. Plastic laminate countertops. Classroom casework will be designed to conventional modular sizes and may be purchased from a manufacturer of standardized institutional casework.

1. Colors: Laminate-cladding will be in a variety of solid colors.
2. Accessibility: Base cabinets with sinks will be designed so that the sinks can be reached by children or teachers in a wheelchair.

Tall Storage Units: 2 per classroom, typical

Wardrobes: Each classroom will have a single two person teacher's wardrobe unit fabricated in the same materials as the classroom cabinets, and fitted with coat hanging rod and shelf.

Teacher Planning and Kitchenette Station Casework: Plastic laminate clad wood casework, fabricated to AWI (American Woodwork Institute) Custom Grade flush overlay design. Plastic laminate countertops. Casework will be designed to conventional modular sizes and may be purchased from a manufacturer of standardized casework.

Colors: Laminate-cladding will be specified in several solid colors.

Reception Desk & Librarian Check Out Station: Custom-fabricated wood veneered plywood with solid wood trim, fabricated to AWI (American Woodwork Institute) Custom Grade standards. Top surface material to be Solid surface.

Adjustable Shelving: Provide utility shelving for storage rooms, copy rooms, and similar locations: Laminate-clad shelves with solid-wood edge banding, supported on extra-heavy duty double slot extruded aluminum stanchions and brackets; 12" deep shelving.

Lab Casework: Base and wall-hung cabinets fabricated with wood cases and interiors with wood veneer doors and drawer fronts. AWI (American Woodwork Institute) Custom Grade, flush overlay design. Epoxy benchtops, 1-1/4"countertops with 4" epoxy backsplash. Basis of design product: CiF Lab Solutions E-line Premium Wood Casework.

Lavatory Counters: Epoxy resin, black, 1-1/4 inch thick, with stainless steel lavatories specified under Plumbing.

Adjustable Shelving: Provide utility shelving for storage rooms, copy rooms, and similar locations: Wood shelves with solid-wood edge banding, supported on extra-heavy duty double slot extruded aluminum stanchions and brackets; 12" deep shelving.

E2010.70 Fixed Multiple Seating

The Auditorium will be furnished with fixed chairs, fully upholstered, with wood armrests and self-rising seats. Row end panels with integral aisle lights, letter and number plates, and swing-away end panels for designated aisle seats will be provided. Seating layout will include areas for wheelchairs to comply with the Americans with Disabilities Act and with the Regulations of the Massachusetts Architectural Access Board.

- Basis of Design Product: Hussey Seating Quattro
- Alternative Products: Irwin Seating Citation; Wenger Corporation Cavea

Materials, finishes, colors, and fabrics are subject to development.

E2010.90 Other Fixed Furnishings

Mirrors: In toilet rooms, provide unframed mirrors extending full width above lavatory counters, mounted to wall on plywood backing with mirror mastic and continuous top and bottom chrome-plated brass or stainless steel edge clips.

Entrance Mats: Extruded aluminum grill-type mat in extruded aluminum frame recessed in concrete subfloor; Construction Specialties "Pedi-Grid."

Entrance Mats: Thin line "T" shaped extruded aluminum blades bolted together, suitable for shallow-pit installation, nominal depth 1-1/2" to 2".

1. Aluminum Finish: Clear mill finish.
2. Acceptable Product: "Ultra Scrape" by Mats, Inc. Stoughton, MA.

Frame: Extruded aluminum frame recessed in concrete subfloor.

Roll-up Entrance Mats: Level-cut-pile nylon carpet, bonded to 1/8- to 1/4-inch-thick flexible vinyl backing, to form mats 3/8- or 7/16-inch-thick with nonraveling edges.

E2050 Moveable Furnishings

All moveable furnishings, such as classroom desks, cafeteria chairs and tables, and office furniture, will be provided by the under a separate Furnishings, Fixtures and Equipment contract.

Telescoping Stands: Electrically-operated, wooden, telescoping bleachers will be provided in the Gymnasium, to accommodate the programmed number of seats.

Bleacher layout will include areas for wheelchairs to comply with the Americans with Disabilities Act and with the Regulations of the Massachusetts Architectural Access Board.

Movable Cots:

F SPECIAL CONSTRUCTION AND DEMOLITION

F10 SPECIAL CONSTRUCTION

F1020 Special Structures

F1020.40 Manufacturer-Engineered Structures

Science Greenhouse: 25' x 10' Greenhouse structure consisting of glazed aluminum framing with a minimum 4:12 roof pitch resting on a 3' concrete masonry block wall, attached to building as shown. Note that one end of the greenhouse will allow for storage of tools and soil and will have a corrugated metal roof. The greenhouse will have a floor drain, a hose bib, a utility light and overhead fan.

F1020.40 Masonry Concessions Building

Concessions building is an uninsulated seasonal masonry building with a 30' by 55' footprint. Construction to be load bearing insulated single wythe CMU. Refer to section b-Shell for exterior wall and roof description. Roof Structure will be tube steel or wide flange beams supported by the reinforced masonry walls. Doors shall be hollow metal on Hollow metal frame. Windows (3), 4'W X4'H on the Concessions area and Storage, and (2) 4'x4' high windows at the toilet room areas. Field storage space will be outfitted with overhead garage door to the field.

F1030 Special Function Construction

F1030.10 Sound and Vibration Control

Lockers: Neoprene pads integral with locker doors in hallways and academic areas, to control noise from door closings.

F1050 Special Facility Components

F1050.10 Pools

Whirlpool: Prefabricated athletic therapy whirlpool unit Basis-of-Design: Whitehall Manufacturing, S series, 110 gallon stationary whirlpool. Material: 304 stainless steel. To be installed in Trainers Rm.

F1060 Athletic and Recreational Special Construction

F1060.10 Indoor Score Boards

Provide Scoreboards for Basketball and Volleyball. Basis-of-Design: Provide NEVCO 2700 (basketball) and 2750 (volleyball) or comparable product, with LED display and wireless scoreboard control.

Provide Shot Clocks, NEVCO Model SCD-7 or equal, with LED display.

F1060.40 Floor Sockets

At Center Court and Weight Room

Volleyball Floor Insert: Solid-brass floor plate; and steel pipe sleeve, concealed by floor plate, with capped bottom end, 3-1/2 inch internal diameter, sized to fit post standards. Product: Draper Inc. with cover plate, or equal.

F1060.50 Athletic and Recreational Court Walls

Wall Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with covered by seamless fabric covering. Provide safety pad fabric covering fabricated from puncture- and tear-resistant, 14-oz./sq. yd PVC-coated polyester or nylon-reinforced PVC fabric treated with fungicide for mildew resistance; with surface-burning characteristics indicated by ASTM E 84, and lined with fire-retardant liner.

F1060.60 Demountable Athletic Surfaces

Gymnasium Divider Curtains: Electrically operated, roll up. Manufacturer to be Draper Inc. or similar. Upper Curtain, Mesh: Woven fabric of 100 percent polyester yarn coated with PVC weighing not less than 6.5 oz./sq. yd. Lower Curtain, Solid: Woven polyester coated with PVC, 18 oz./sq. yd, embossed, 8-foot height above floor. Passes NFPA 701, permanently flame resistant.

F20 FACILITY REMEDIATION

F2010 HAZARDOUS MATERIALS REMEDIATION

F2010.10 Transportation and Disposal of Hazardous Materials

The Architect's consultant, Smith and Wessel Associates, Inc. (SWA) performed a preliminary assessment of the interior of the building to determine the presence and extent of hazardous materials. Their report, dated July 27, 2022 was delivered to the Owner under separate cover. The study was limited in scope and concentrated on identifying large ticket items that, if present, would require cost for their handling and disposal. The following materials were visually observed:

Mercury: Present in fluorescent light ballasts throughout the building. SWA estimates that there are approximately 2,575 fluorescent bulbs that will require proper handling and disposal/recycling in facility permitted to accept "Universal Wastes".

F2010.20 Asbestos Remediation

Asbestos: In brief, the preliminary assessment identified asbestos-containing materials (ACM) in the form of the following materials:

- in pipe fitting insulation
- in carpet mastic
- in resilient floor tile/mastic
- in wall/window/canopy/fume hood panels
- in vapor/moisture barriers
- in fire door insulation
- in mudding fittings
- in door and window caulking
- in window glazing compound
- in ceiling glue daubs
- in chalk/whiteboard daubs
- in wall panel glue
- in roofing materials
- in floor vapor barrier

These materials will have to be removed prior to renovation or demolition work in areas where it may be disturbed. A more detailed assessment will follow during the design development phase of the project.

F2010.30 Lead Remediation

Lead Based Paint: Elevated levels of lead-based paint (lead content greater than 1.0 mg/cm²) are present on the **exterior metal canopy structure and the interior terracotta wall**. Lead paint does not have to be removed before renovation **or demolition**, but components that are covered by LBP may require special handling and disposal, personnel air monitoring and other work protection in compliance with the OSHA lead standard.

F2010.40 Polychlorinated Biphenyl Remediation

PCBs: While not confirmed, PCBs may be present in fluorescent lamp ballasts, window glazing compound, wall expansion joint compound and door caulking. Handle and dispose of as universal waste. The existing transformer is assumed to be the

property of the local power company and should be addressed by the power company if removed.

F30 DEMOLITION

F3010 Structure Demolition

F3010.10 Building Demolition

Demolish the entire existing building per phasing plan, including foundations. Prior to demolition, abate hazardous materials.

G SITEWORK

G10 SITE PREPARATION

G1010 Site Clearing

G1010.05 General Requirements

The existing East Longmeadow High School is to remain functional, including vehicle access, utilities, parking, and all other functions critical to the use of the school, until such time that the existing school building has been vacated and all operations have been moved into the new school building. Any necessary temporary parking, access drives, and/or play areas are to be reconfigured for the existing school building and maintained throughout construction of the new school building.

Provide and maintain construction access from Maple Street and Norden Street. Locations of specific access will depend on the sub-phase.

Maintain safe access for emergency vehicles to the site and existing High School throughout the duration of construction.

G1010.10 Clearing and Grubbing

All site clearing and erosion & sediment control measures for the site will be in compliance with the Town of East Longmeadow standards and the NPDES General Permit from the EPA. If an Order of Conditions from the Town of East Longmeadow Conservation Commission is required, it will be obtained at the completion of permitting and the conditions will be incorporated into the required measures. Provide and maintain erosion control measures to protect sediment from entering the storm drain system and adjacent resource areas.

Provide temporary protective barriers consisting of post driven 8' high chain link fence with tension wire top and bottom and windscreen privacy screen to enclose the project site and construction activities. Provide 8' high x 20' clear double leaf chain link access gates at construction entrances. Maintain and adjust the temporary protective barriers as needed throughout the course of construction.

Protect all utilities to remain in Maple Street, Norden Street, and within the site, throughout construction. Coordinate any temporary service interruptions with the Town of East Longmeadow and any owners affected.

Temporary signage shall include a total of 30 signs.

G1010.30 Tree and Shrub Removal and Trimming

Remove vegetation within the limit of work as shown on the drawings.

Existing trees to remain will be tagged in the field by the Architect and protected by the Contractor with a 4' height chain link fence during construction. A 4" layer of bark mulch will be spread a distance of 1.5x the DBH of the tree. Costs for damage to existing trees will be estimated by caliper inch at breast height based on AAN standards.

Prune trees according to ANSI A300 (Part 1).

G1010.50 Earth Stripping and Stockpiling

Existing topsoil will be stripped, stockpiled, and reused on-site. Existing topsoil is to be augmented as necessary to meet specifications for loam. Before reuse, topsoil will be tested, and the necessary amendments added as defined by chemical and mechanical soil tests. Topsoil will be stabilized with vegetation until screened and spread on site. Excess topsoil will remain the property of the Town. The Contractor is to transport excess topsoil to a location determined by the Town within the Town boundaries.

Strip overburden soils from limit of work and dispose off-site in accordance with all applicable local, state, and federal codes and requirements.

G1020 Site Elements Demolition

G1020.10 Utility Demolition

All utilities associated with the existing building are to be maintained until such time that the building has been vacated and prepared for demolition. Upon the building being vacated these utilities will be removed to the extents indicated on the drawings, including removal of the existing underground fuel oil tank and associated piping.

Existing above and below ground utilities within the proposed building footprint are to be removed or relocated in their entirety, as shown on the drawings. The remainder of existing above and below ground utilities within the remaining limit of work are to be protected and maintained unless specifically designated to be removed or relocated on the drawings.

G1020.50 Selective Site Demolition

Remove and dispose of buildings/structures, pavements, curbing, sidewalks, slabs, fencing/guardrails, backstops, walls, seating, signs, light poles, flag poles, site furnishings, trees, vegetation, and any other site elements within the limit of work as shown on the drawings.

Do not disturb existing site features scheduled to remain. Provide safe access to adjacent buildings and features to remain throughout construction as necessary. Provide erosion control measures to protect sediment from entering the storm drain system.

Salvage site improvements as shown on the drawings. Salvaged items are to be stored in an area designated by the District that is protected from the elements and construction operations.

G1030 Site Element Relocations

G1030.10 Utility Relocation

Relocate any utilities that interfere with the new school building construction as shown on the drawings.

G1050 Site Remediation

G1050.60 Contaminated Site Material Removal

See the attached Phase 1 Site Assessment.

G1070 Site Earthwork

G1070.10 Grading

Grade site to the elevations shown on the drawings.

G1070.20 Excavation and Fill

Excavate for building foundations, retaining walls, seat walls, structures, utilities, slabs, equipment pads, sports field and court equipment, playgrounds, foundations and footings for site features, drives, walks, parking areas, bioretention areas, and plantings including bracing and support as required.

Subsurface investigations identify reworked soils/fill within the building footprint at depths ranging from 1.5 feet to 3 feet deep. Fills within the building area and for a distance of 10 feet along the building perimeter, are to be excavated out to a minimum depth of 6" below bottom of footing elevations and 8" below the bottom of floor slab elevation to allow for placement of imported crushed stone and gravel base course layers respectively. The remaining fill within this area may remain in place provided it be proof compacted prior to installing any materials over it. Any existing fill that is considered unsuitable within this area is to be removed until such depth that suitable fill or native soils are reached, and replaced with imported structural fill. Excavated fill may be reused elsewhere on site as common fill.

Existing fill material is to be removed to the bottom of hardscape base course elevations where applicable, to allow for the installation of the full depth section of hardscape material. Any existing fill that is considered unsuitable is to be removed where within 36 inches of the finish grade within hardscape areas, including concrete equipment pads. Resultant grades are to be brought up to the bottom of base course gravel with imported structural fill.

Unsuitable material that is not suitable for reuse is to be hauled off site in accordance with all local, state, and federal regulations.

Prepare subgrade and bearing surfaces, including ground improvements, proofrolling and dewatering. Dewater as necessary to maintain groundwater levels at a minimum of two feet below proposed bottom of footing elevations throughout the duration of foundation excavation, installation, and backfill.

Place and compact fills from onsite and offsite sources. Compact fill layers below building and pavement to 95% Maximum Dry Density, per ASTM 1557. All base course materials below pavement and building areas will be required to meet MassDOT specifications for structural fill. Fill in landscape areas will meet the specifications for common fill.

Prepare subbase and base courses for buildings, pavements, and athletic field areas.

Prepare landscape areas including preparation of subgrade and placement of topsoil.

All imported material is to be clean, native, and uncontaminated from a borrow pit.

G1070.35 Erosion and Sedimentation Controls

Erosion and sediment controls will be placed around the downstream perimeter of each phase of the project as well as around soil stockpile areas. Install and maintain inlet sediment control measures at existing inlets to the storm drain system.

G20 SITE IMPROVEMENTS

G2010 Roadways

G2010.10 Roadway Pavement

Heavy Duty bituminous flexible pavement: 3" binder course, 1½" wearing course on an 18" gravel base in locations shown on the drawings. Materials in compliance with Section 460 of the MassDOT Standard Specifications.

Standard Duty bituminous flexible pavement: 2½" binder course, 1½" wearing course on a 12" gravel base in locations shown on the drawings. Materials in compliance with Section 460 of the MassDOT Standard Specifications.

The surface material in the loading dock area will consist of thickened Portland cement concrete pavement with reinforcement on a gravel base to the extents shown on and as detailed on the drawings.

The surface material in the emergency access path will consist of a combination of porous asphalt pavement and reinforced turf surfacing to the extents shown on the drawings. The reinforced turf surfacing will include rigid cellular polyethylene interlocking grid units capable of supporting H20 loads on a gravel base.

G2010.20 Roadway Curbs and Gutters

Entry and access drives: VA4 vertical and flush granite with transition sections as necessary to the extents shown on the drawings.

Bus van and parent drop-off areas: VA4 vertical and flush granite with transition sections as necessary to the extents shown on the drawings.

Emergency access points: 6" x 18" mountable granite curb with 3" x 3" chamfer with transition sections as necessary to the extents shown on the drawings.

G2010.40 Roadway Appurtenances

Traffic Signage: Provide applicable traffic signage to offer guidance for the proposed vehicular circulation system. Refer to the Traffic and Parking Signs summary table shown on the drawings for sign panel quantities, dimensions, graphics, and for post types.

Pavement Markings: Provide pavement markings as shown on the drawings. Existing roadway striping within the limit of work that is disturbed by the construction is to be re-striped.

G2010.70 Roadway Lighting

Roadway lighting is specified in Section G5040.90 "Exterior Lighting".

G2020 Parking Lots

G2020.10 Parking Lot Pavement

Heavy Duty bituminous flexible pavement: 3-inch binder course, 1 ½-inch wearing course on an 18-inch gravel base in locations shown on the drawings. Materials in compliance with Section 460 of the MassDOT Standard Specifications.

Standard Duty bituminous flexible pavement: 2 ½-inch binder course, 1 ½-inch wearing course on a 12-inch gravel base in locations shown on the drawings. Materials in compliance with Section 460 of the MassDOT Standard Specifications.

Permeable pavers: precast pavers over aggregate base in locations shown on the drawings.

Approximately 464 parking spaces will be provided on site to serve faculty, staff and visitors, including 18 accessible spaces and 10 spaces serviced by EV charging stations.

G2020.20 Parking Lot Curbs and Gutters

Parking lot curbing: VA4 vertical granite and flush granite with transition sections as necessary to the extents shown on the drawings.

Emergency access points: 6" x 18" mountable granite curb with 3" x 3" chamfer with transition sections as necessary to the extents shown on the drawings.

G2020.40 Parking Lot Appurtenances

Parking Signage: Provide signage for parking areas, including but not limited to accessible spaces, school resource officer, electric vehicle charging, low emitting / fuel efficient vehicles, and Pre-K pick-up and drop-off. Refer to the Traffic and Parking Signs summary table shown on the drawings for sign panel quantities, dimensions, graphics, and for post types.

Precast Concrete Wheel Stops: Provide wheel stops at accessible spaces, EV charging parking spaces, and standard spaces adjacent to flush and transition curbs as shown on the drawings.

Pavement Markings: Provide pavement markings as shown on the drawings.

G2020.70 Parking Lot Lighting

Parking lot lighting is specified in Section G5040.90 "Exterior Lighting".

G2030 Pedestrian Plazas and Walkways

G2030.10 Pedestrian Pavement

Pedestrian walkways will consist of a combination of portland cement concrete pavement and bituminous pavement. Portland cement concrete pavement will have broom finish and saw cut joints. Bituminous pavement will consist of 1½" binder course, 1½" wearing course, on an 8" gravel base as shown on the drawings.

The main entrance plaza will consist of portland cement concrete pavement with broom finish and saw cut joints on a gravel base.

Provide cast iron detectable warning panels at all accessible parking spaces, curb cut locations, and at crosswalks as shown on the drawings.

Portions of site walkways will consist of precast unit pavers on a gravel base to the extents shown on the drawings.

Outdoor classroom and dining areas will consist of a combination of integrally colored concrete pavement with broom finish and saw cut joints and precast unit pavers on a gravel base as shown on the drawings.

Access space around exterior utility pads to be 6" depth of ¾" crushed stone over geotextile fabric to the extents shown on the drawings.

G2030.20 Pedestrian Pavement Curbs and Gutters

Flush sidewalk and accessible curb cut ramp conditions: VA4 flush granite curb or flush concrete pavement, integral with the adjacent concrete sidewalk.

G2030.30 Exterior Steps and Ramps

Ramps: Cast-in-place portland cement concrete with broom finish and saw cut joints on a gravel base. Widths and slopes conforming to ADAAG and MAAB. Schedule 40 galvanized steel pipe guardrails and handrails each side of ramp to the extents shown on the drawings.

Loading dock: Provide schedule 40 galvanized steel pipe guardrail at edge of loading dock as shown on the drawings.

G2030.70 Plaza and Walkway Lighting

Plaza and walkway lighting is specified in Section G5040.90 "Exterior Lighting".

G2030.80 Exterior Pedestrian Control Equipment

Provide (4) solar-powered, rectangular rapid flashing pedestrian crossing beacons with related signage and concrete footing, complete in place, in locations shown on the drawings.

G2050 Athletic, Recreational, and Playfield Areas

G2050.10 Athletic Areas

Provide (6) tennis courts: bituminous flexible pavement consisting of 2½" binder course, 1½" wearing course on a gravel base, textured acrylic color coat system in up to (2) standard colors, painted tennis layout, tennis nets with posts and center anchors in locations shown on the drawings. Colors to be selected by Architect.

Provide painted striping and portable nets for (6) pickleball courts overlaid onto tennis courts as shown on the drawings. Color to be selected by Architect.

Provide new concrete foundations for sport court lighting system for (6) tennis courts, in locations shown on the drawings. Light poles to be located to properly illuminate the entire area of the courts to meet IES recommended light levels. Existing fixtures and poles are to be salvaged and reinstalled on the new bases.

Provide (2) basketball courts: bituminous flexible pavement consisting of 2½" binder course, 1½" wearing course on a gravel base, textured acrylic color coat system in up

to (2) standard colors, painted basketball layout, and basketball goals with posts in locations shown on the drawings. Colors to be selected by Architect.

Provide prefabricated, elevated 10' wide x 36' long press box and steel support structure as shown on the drawings. Finished floor of press box to be at a height of approximately 12 feet above finished grade. Press box to be properly mounted to reinforced concrete slab with perimeter frost wall as shown on the drawings.

Provide an ADA and MAAB compliant accessible steel ramp system with mid-landings and integral handrails and guardrails that extends from finished grade up to the finished floor of the press box as shown on the drawings. Properly mount accessible ramp system to a Portland cement concrete slab with broom finish and saw cut joints as shown on the drawings.

G2050.30 Recreational Areas

Playground surfacing: 3" minimum depth of 2-layer rubber aliphatic polyurethane poured-in-place surfacing system with play hill as shown on the drawings. System to comply with ASTM F-1292 and be certified by IPEMA. Provide 12-inch-wide reinforced, poured-in-place concrete edge curb as shown on the drawings.

G2050.50 Playfield Areas

Provide (1) varsity boys baseball field complete with (2) dugouts set on concrete pads, (2) players benches, (2) concrete bleacher pads, electronic scoreboard, (2) foul poles, painted and chalk lines, and all necessary baseball field equipment, complete in place, in location shown on the drawings.

Provide (1) junior varsity boys baseball field complete with (2) dugouts set on concrete pads, (2) players benches, (2) 20' height foul poles, painted and chalk lines, and all necessary baseball field equipment, complete in place, in location shown on the drawings.

Provide (1) varsity girls softball field complete with (2) dugouts set on concrete pads, (2) players benches, (2) concrete bleacher pads, electronic scoreboard, (2) 20' height foul poles, painted and chalk lines, and all necessary softball field equipment, complete in place, in location shown on the drawings.

Provide (1) junior varsity girls softball field complete with (2) dugouts set on concrete pads, (2) players benches, (2) foul poles, painted and chalk lines, and all necessary softball field equipment, complete in place, in location shown on the drawings.

Provide (2) vinyl-clad chain link batting cages with artificial turf surfacing, pitcher's circle, batters box, and overhead netting with vinyl-clad steel frame in locations shown on the drawings.

Provide athletic field topsoil profile and athletic field lawn seed mix as shown on the drawings and as specified in Section G2080 Landscaping.

Provide skinned infield mix for boys baseball and girls softball infield and warning track areas to the extents shown on the drawings.

Provide painted overlay striping layout for soccer as shown on the drawings, showing any field lines, markings, and boundaries on the field.

Provide natural turf football field with (2) permanent football goal posts, (2) players benches, and painted striping layout for football as shown on the drawings.

Provide natural turf soccer/girls lacrosse field with (2) soccer goals, (2) lacrosse goals, (2) players benches, and painted striping layout for soccer and girls lacrosse as shown on the drawings.

Provide natural turf soccer/boys lacrosse field with (2) soccer goals, (2) lacrosse goals, (2) players benches, and painted striping layout for soccer and boys lacrosse as shown on the drawings.

Provide natural turf practice field with perimeter painted striping as shown on the drawings.

Reinstall salvaged lacrosse throwing wall and artificial turf surfacing as shown on the drawings.

G2060 Site Development

G2060.20 Fences and Gates

Provide 4', 6', and 10' height vinyl-clad chain link fence with single and double access gates in locations shown on the drawings. Provide yellow HDPE coil fence crown for fencing at baseball and softball fields.

Provide 24' height vinyl-clad chain link fence backstops for baseball and softball fields in locations shown on the drawings.

Provide pressure-treated wood guardrail with hot dipped galvanized steel hardware and fasteners in locations shown on the drawings.

Provide pressure treated, double-leaf wood swing gate with (2) pressure treated keeper posts and hot dipped galvanized steel hardware and fasteners in locations shown on the drawings.

G2060.25 Site Furnishings

Bicycle Racks: Provide thirty-five (35) hoop style 2-capacity bicycle racks, 27" high by 25" diameter, with powdercoated steel finish. Each bicycle rack shall be in-ground mounted into a concrete footing.

Flexible seating: Provide thirteen (13) sets containing a freestanding table with four (4) freestanding chairs for outdoor dining terrace and science outdoor teaching space at the rear of the building.

Permanent seating: Provide four (4) direct mount 72" length picnic tables with eight (8) benches made of steel structure connected with steel grate by means of stainless-steel screw joints with zinc coating and powder coating. Anchored under the paving into concrete foundation using threaded rods. One table to be ADA accessible model. Basis of design: Tably by M.M.Cite.

Combination Trash and Recycling Receptacles: Provide nine (9) 45-gallon split-stream solid cast aluminum combination trash and recycling receptacles with powdercoated finish and associated graphics.

G2060.30 Exterior Signage

Provide one (1) freestanding, two-sided masonry school identification sign wall, 4' height x 15' length, with 12" height stainless steel cut letters and numbers to identify the name and street address of the school. Letter and number font and finish to be selected by the Architect.

School identification sign wall uplighting is specified in Section G5040.90 "Exterior Lighting".

LEED educational sign bases to consist of 2"x4"x1/8" rectangular aluminum tube leg with 2" depth x 1/8" aluminum tube graphic panel base welded to leg. All aluminum surfaces are to receive fluoropolymer finish. Assume (4) Type A signs and (4) Type B signs as shown on the drawings.

G2060.35 Flagpoles

Provide one (1) ground set, internal halyard flagpole with brushed aluminum finish, anodized finial ball, and reinforced concrete footing. 35' height. Provide one (1) 6' x 10' two-ply polyester United States of America flag.

Flagpole uplighting is specified in Section G5040.90 "Exterior Lighting".

G2060.40 Covers and Shelters

Shade structure: Provide five (5) 94" x 118" and nine (9) 118" x 118"; total 130.33' LF (outer arc). Radial Shade Structure is based on the Streetlife Rough&Ready Shades Curved. Shade Structures consist of modular sections in (2) sizes 94" x 118" and 118" x 118" each with a 32.8' radius and 9.83' height. Steel structure with hot-dip galvanized finish and 2.8" x 5.9" Accoya wood beams attached to an integrated curved beam. Accoya wood has a 40-50 year lifespan and is FSC Mix 70% nontropical. Include all related appurtenances and footings.

Pre-K Playground Storage Shed: Provide one (1) 6' x 8' enclosure made from wood and steel with shed roof and double entry door on one side. Shed roof will be 6' height at back and 8' height at front. Walls of the structure would be made of framed panels of 1x4 natural white cedar attached to 4x4 galvanized tube steel posts on the corners and

center of walls with L-angle steel at top and bottom. Gates will consist of similar framed cedar panels attached to a 2x2 steel tube frame with steel hinges. Shed roof will consist of corrugated roofing panels attached to a welded galvanized steel frame. Shed will have 4' depth sonotube footings and a 7' x 9' x 5" thick concrete slab.

G2060.60 Site Walls

Retaining walls at loading dock accessible ramp: Cast-in-place reinforced concrete, heights as shown on the drawings. Accessible ramp slab and haunch to be keyed into top of retaining wall as shown on the drawings.

Seat walls in front entrance plaza and outdoor learning environments to be standard colored precast concrete with light sand blasted finish on a poured-in-place concrete base. Precast color to be standard red to match building panels. Seat wall to be 24" wide seats that are double sided with 18" exposed height. Radii, lengths and locations to be as shown on the drawings.

G2060.70 Site Bridges

Bioretention area crossing: Complete prefabricated, single span truss bridge system consisting of weathering steel construction, safety rails each side with rail frame, wood rub rail, and horizontal balusters, integrally colored reinforced concrete deck with galvanized form deck underlay, precast reinforced concrete abutments, and all required fasteners to the extents shown on the drawings. Bridge to provide span of 56 linear feet. Basis of design is Contech Connector® Pony Truss pedestrian bridge system with weathering steel finish and RigidWall™ anchored wall system bridge abutments.

G2060.85 Site Specialties

Site bollards at bus drop-off and parent drop-off to be 6" diameter x 36" exposed height concrete-filled, galvanized Scheduled 40 steel bollards with welded cap, primed and painted with two (2) coats of enamel, locations and quantities as shown on the drawings.

Site bollards at loading and utility areas will be 6" diameter x 60" exposed height concrete-filled, galvanized Scheduled 40 steel bollards with welded cap, primed and painted with two (2) coats of enamel, locations and quantities as shown on the drawings.

Mow strip along portions of building perimeter to be decomposed granite with integral stabilizer binder and geotextile fabric over dense graded aggregate base to the extents shown on the drawings. Provide 3/16" x 4" steel landscape edging where mow strip abuts lawn or landscaped areas as shown on the drawings.

Placed landscape boulders and boulder retaining rows: Native red stone. 67% to have length and width range of 2' to 4' and 33% to have length and width range of 4' to 6'.

G2080 Landscaping

G2080.10 Irrigation

Automatic irrigation system and all accessories and appurtenances shall be provided for only the varsity boys baseball field, varsity girls softball field, natural turf soccer/girls lacrosse field, natural turf soccer/boys lacrosse field, and natural turf football field as shown on the drawings.

An above-grade water valve with meter assembly is to be provided off of the 8" water distribution main where the irrigation system begins.

G2080.20 Turf and Grasses

General lawn areas shall be provided in the locations shown on the drawings. Athletic field lawn areas shall be provided in the locations shown on the drawings. Seed mixes for both lawn area types will be appropriate to their use.

Native meadow grass areas at cut slopes and perimeter restoration areas shall be provided in the locations shown on the drawings. The seed mix for the native meadow grass areas will be appropriate for its use.

Bioretention areas shall be provided in the locations shown on the drawings. The seed mix for bioretention areas will be appropriate for its use.

G2080.30 Plants

Trees, shrubs, ornamental grasses and perennials will be provided to complement the site and public areas.

G2080.50 Planting Accessories

Provide eighteen (18) inches of planting soil in plant bed areas, eight (8) inches of topsoil in general lawn areas, and eight (8) inches of topsoil in athletic field lawn areas as per specified topsoil preparation and amendment additives. All topsoil shall be reused, amended on-site topsoil with supplemental topsoil imported from off-site sources as necessary. Topsoil is to contain no material greater than one (1) inch diameter.

Provide bioretention soils at the depths and locations shown on the drawings.

Include inorganic and organic soil amendments and fertilizers as necessary.

Include shredded pine bark mulch at a minimum depth of three (3) inches.

Include all staking, guying, and other tree stabilization materials as necessary.

Include watering at least twice per week for plant establishment during the maintenance period.

G2080.70 Landscape Lighting

Landscape lighting is specified in Section G5040.90 "Exterior Lighting".

G2080.80 Landscaping Activities

Contractor shall provide a 90-day maintenance period for all plantings, bioretention areas, meadow areas, and lawn areas. Contractor shall warranty plantings for one (1) year to ensure the health and establishment of all plantings.

G30 SITE UTILITIES

G3010 Water Utilities

G3010.10 Site Domestic Water Distribution

The water distribution main will be 8-inch Class 52 ductile iron pipe. The new main will connect to the downstream side of the existing meter pit and be routed around the full perimeter of the building. The water main serves as distribution for fire protection water as well – see Section G3010.30.

The domestic water service to the school building will be 6-inch Class 52 ductile iron pipe, routed off of the water distribution main.

The domestic water service to the concession building will be 2-inch Type "K" copper tubing.

The pipe shall be furnished with necessary materials and equipment recommended by the manufacturer for use in joining pipe lengths and fittings conforming to ANSI Specifications.

G3010.30 Site Fire Protection Water Distribution

The water distribution main will be 8-inch Class 52 ductile iron pipe (serves as distribution for domestic water as well). The fire protection service to the school building will be 8-inch Class 52 ductile iron pipe, routed off the water distribution main.

The pipe shall be furnished with necessary materials and equipment recommended by the manufacturer for use in joining pipe lengths and fittings conforming to ANSI Specifications.

Fire hydrants will be provided at locations shown on the plan and shall be served by a 6-inch Class 52 ductile iron pipe off of the water distribution main.

G3020 Sanitary Sewerage Utilities

G3020.20 Sanitary Sewerage Piping

Polyvinyl Chloride (PVC) Pipe for Sanitary Sewage Conveyance via gravity: Sanitary Sewage discharge pipes from the school building shall be 6-inch diameter polyvinyl chloride (PVC) pipe. Sewage discharge pipes from the concessions building shall be 4-inch diameter PVC pipe. Sanitary Sewage mains shall be 8-inch diameter PVC pipe. Sanitary Sewage pipe shall be type PSM, SDR-35 PVC pipe.

PVC Pressure Pipe (Force Main): Provide 2-inch, Schedule 40 PVC pipe for force main applications and where shown on the plans.

G3020.40 Utility Vaults and Tanks

The precast reinforced concrete vault and tank structures shall be designed by a Massachusetts Registered Professional Engineer employed by the Contractor.

Concrete shall have a minimum 28-day compressive strength of 5,000 psi using Type II or III Portland cement.

Kitchen waste will discharge to a 5,000 gallon precast concrete grease trap.

Pipe Connections: Vault and tank structures shall have pipe openings to accept the type of pipe specified. Pipe opening shall be minimum size required to receive the pipe and shall be accurately set to conform to the required line and grade.

Sanitary Sewer Pump Station: the wet well and valve pit shall be precast concrete structures of the dimensions shown on the plans. Provide two (2) – 3 horsepower submersible pumps with related components and accessories.

G3020.50 Sanitary Sewerage Structures

Precast Concrete Manholes: Precast reinforced concrete manhole structures shall comply with material, design, and construction standards specified under ASTM C478. Manholes shall be 4-foot diameter. Manhole tops shall be precast concrete designed to meet American Association of Standard Highway and Transportation Officials (AASHTO) H20 loadings. Frames and covers shall be of cast iron.

Cleanouts shall be cast iron with a heavy-duty brass top. Cleanout frame and cover shall be set in concrete 12 by 12 by 6-inches deep, except where location is in bituminous paving.

G3030 Storm Drainage Utilities

G3030.10 Storm Drainage Utility Collection

Storm water from the site and building will be collected by a network of catch basins, areas drains, and trench drains, and then conveyed to the discharge point at the

existing detention pond via a series of manholes and piping. Portions of the storm water runoff will be routed to bioretention areas, porous pavement, permeable pavers, and subsurface infiltration chambers for treatment, infiltration, and detention, prior to downstream conveyance of overflow.

G3030.20 Storm Drainage Piping

Storm drain pipe will be Corrugated Polyethylene, with the exception of pipe segments specifically noted to be Reinforced Concrete.

G3030.40 Site Storm Water Structures

Catch Basins including Frame and Grate: Precast reinforced concrete catch basins shall comply with material, design, and construction standards specified under ASTM C478. Diameter of structure to be 4 feet. Frames and grates shall be of 4-flange cast iron. Catch basins shall have removable hoods and a minimum 4-foot deep sump.

Area Drains including Frame and Grate: Precast reinforced area drains shall comply with material, design, and construction standards specified under ASTM C478. Diameter of structure to be 2.5 feet. Frames and grates shall be of 4-flange cast iron. Area drains shall have a minimum 2-foot deep sump.

Manholes: Precast reinforced concrete manhole structures shall comply with material, design, and construction standards specified under ASTM C478. Frames and covers shall be of cast iron.

Trench drains shall be a pre-engineered, manufactured system that conforms to the design loading requirements of AASHTO H-20. Channels shall be manufactured from polyester resin polymer concrete with an integrally cast-in ductile iron edge rail.

Underground Infiltration Basins: Underground infiltration basins shall be composed of corrugated arches made of either impact modified polypropylene or polyethylene copolymer. The arches shall be arranged as indicated on the plans and the system should be as indicated on the detail. $\frac{3}{4}$ " crushed stone to be used as backfill from 6 inches below the base of the arches to 6 inches above the top of arches, with the entire system wrapped with non-woven geotextile fabric.

Outlet Control Structures: Outlet control structures for the underground infiltration basins to be 5-foot by 5-foot precast reinforced concrete with concrete baffle wall, in compliance with material, design, and construction standards specified under ASTM C478. Frames and covers shall be of cast iron.

Water Quality Structures/Systems: Precast reinforced concrete water quality structures shall comply with material, design, and construction standards specified under ASTM C478. Frames and covers shall be of cast iron. The water quality structure shall have a proven laboratory test record of having the capability to remove a minimum of 80 percent of the sediment load from the low-flow storm conditions from the total catchment area of the contributing drainage system.

Bioretention Basins: The bioretention basin shall be constructed of a sand base layer, pea stone, drainage fabric geotextile, and bioretention soil media. See Section G2080 for information on bioretention seed mix.

See Sections G2020 and G2030 for information on porous pavement and permeable paver systems.

G40 ELECTRICAL SITE IMPROVEMENTS

G4010 Site Electric Distribution Systems

Site electrical utilities will include excavation and backfill for underground ducts, manholes, handholes, cables, and concrete encasement of specific ducts, for extending electric utility services from the various utility connection points into the building. Replacement of one (1) utility pole within the site by the utility service provider is anticipated. The extension of the service will be designed and installed to comply with the specific utility standards and regulations. The utility service provider will be consulted to determine specific requirements for the project. The proposed point of connection is as shown on Site Plan.

Utility Company Transformers: Utility company transformers will be of the pad mount type and be located as shown on the Electrical Site plan. Oil containment to be provided around the pad.

Emergency Generator: An emergency generator in a weather protective enclosure will be located adjacent to the building as shown on the Electrical Site plan.

Refer to Section D5020 for additional information on the site electric distribution systems.

G4050 Site Lighting

Refer to Section D5040.90 "Exterior Lighting".

Exterior building lighting will consist of building mounted LED (at egress doors) and pole mounted dimmable LED full cut-off fixtures (for parking lots, roadways, and walkways), with house side optics as appropriate for installation adjacent to residential houses and property lines. Exterior lighting will be time switched and/or photo-cell controlled via programmable lighting control system. Light fixtures and lighting levels will be designed in accordance with IESNA and LEED. The lighting fixtures mounting height, type and location will be selected to avoid glare and light spillover beyond the property line in compliance with East Longmeadow zoning by-laws and LEED for Schools requirements, including Reduced Energy and Light Pollution credits. The system will comply with energy use limitations per Massachusetts Building Code and referenced International Energy Code 2021.

G50 SITE COMMUNICATIONS

G5010.30 Site Communications Distribution

Work will include excavation and backfill for underground ducts, manholes, handholes, and cables for extending Internet, Telephone and CATV utility services from the utility connection point into the building. The service extension will be designed and installed to comply with the specific utility standards and regulations.

The proposed point of connection will be in a dedicated Telecommunications Entrance Facility that will be located near the Main Electric Room service entrance.

Refer to Section D60 for additional information on the communications distribution systems.

G5010.50 Wireless Communications Distribution

The grounds around the new high school will be wired to support outdoor wireless access points that will provide network connectivity for student and staff access. Areas of coverage will include outdoor learning spaces and areas in proximity to the new school where students will congregate. Further discussion is required to determine the desired level of wireless access coverage will be provided in more remote locations such as the athletic fields.

Z GENERAL

Z10 GENERAL REQUIREMENTS

Z1010 Price and Payment Procedures

Z1010.20 Unit Prices

Unit prices proposed by the Bidders and accepted by the Owner will be used as the basis for adjusting the Contract Price should actual quantities of work differ from the quantity included in the base Contract Price.

Bidders will be required to provide unit prices for the following types of Work:

1. Various classes of earthwork.
2. Miscellaneous and structural steel.
3. Various types of asbestos abatement work

Z1010.30 Alternates

Alternates will be identified by the Architect in consultation with the Owner during the Contract Documents phase, as a means for insuring that the Project will be constructed within the budget.

Z1010.50 Substitution Procedures

The Owner and the Architect will consider substitutions only when one of the following conditions applies:

1. The substitution is proposed for cause.
2. The substitution will provide a clear benefit to the Owner, such as the same performance and quality at a lower cost, or better performance and quality at the same cost, or an improved construction schedule.
3. The proposed substitution is an "equal" as defined by M.G.L. Ch. 30, s. 39M(b).
4. Identify product or fabrication or installation method to be replaced. Use Substitution Form provided in the Project Manual. Provide documentation detailed side-by-side comparison of significant qualities of proposed substitution with those of the Work specified.
 - a. Provide certification that the substitution will not adversely affect project goals for number of points and certification under LEED V4 or MSBA Green Incentive Points compliance.

Z1010.60 Contract Modification Procedures

When modifications are initiated by the Owner, the Architect will ask the Contractor to prepare a cost proposal for the change, for review by the Architect and Owner.

Changes may also be proposed by the Contractor, for limited reasons set forth in the Contract Documents.

Change Orders have to be accepted and signed by the Owner, the Architect and the Contractor.

Changes to which the Contractor has not yet agreed with respect to payment, may be implemented as a Construction Change Directive, signed by the Owner and the Architect. CCD's will become CO's when accepted and signed by the Contractor.

Z1010.70 Payment Procedures

Schedule of values: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule and submittals schedule. Where the Work is separated into phases requiring separately phased payments, provide sub schedules showing values correlated with each phase of payment.

Projected applications for payment report: Submit a report indicating projected Applications for Payment to the Architect concurrent with submittal of the Contractor's initial construction schedule and prior to submitting the initial Application for Payment.

Applications for payment: Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

Z1020 Administrative Requirements

Z1020.10 Project Management and Coordination

Refer to the Project Description, Section 2010, for a discussion of employing a Construction Manager at risk. The term "Contractor" as used throughout this document shall refer to either the construction manager at risk or the general contractor, as applicable.

Contractor will be required to employ a Project Manager and a Superintendent. The Superintendent will be on site full time during construction, and will be responsible for scheduling Progress Meetings.

The Owner will employ a Project Representative who will be on site full time during construction.

Applications for payment will be submitted monthly by the Contractor, in accordance with statutory requirements. The Architect will review and approve Applications for Payment.

Z1020.30 Construction Progress Documentation

Construction progress documentation includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Daily construction reports.
4. Material location reports.
5. Site condition reports.
6. Construction waste plan/monthly progress reports.
7. Indoor Air Quality (IAQ) plan/monthly progress reports.
8. Sustainable materials attributes monthly progress reports.

Z1020.50 Submittal Procedures

The Contractor will prepare and submit for the Architect's review Action Submittals such as Shop Drawings, Samples, Product Data and Informational Submittals such as Certificates, Test Reports, and Material Safety Data Sheets (MSDS).

Architect will review and approve or otherwise comment on Action Submittals which are required by the Specifications.

Architect will review but will not be required to approve or take action on Informational Submittals.

LEED Credits: Where information about material content or chemical emissions is required in order to document compliance with LEED V4 Credit requirements.

Z1040 Quality Requirements

Z1040.40 Quality Assurance

Contractor will be responsible for developing procedures to measure and report the quality and performance of construction, and for confirming that fabricators, installers, manufacturers testing agencies, and others involved in the construction process meet the specified requirements.

Z1040.80 Quality Control

The Contractor will be required to provide the services of a Registered Engineer or Registered Land Surveyor to lay out locations and elevations for the building and for site improvements.

The Owner will employ a testing and inspection agency to perform the following tests and inspections:

1. Inspect soil for proper compaction and moisture content under footings, foundations, and slabs on grade.
2. Review concrete mix design, perform slump tests, and analyze results.
3. Inspect structural steel connections.
4. Review mortar mix design, and perform testing of mortar and masonry units.
5. Full-time roofing inspection.
6. Field testing of windows and curtain wall for water leakage and air infiltration.
7. HVAC and building system performance.

All other testing and inspection will be by the Contractor including whole building verification in compliance with Massachusetts Stretch Code requirements (See sustainability requirements DD Appendix).

Z1050 Temporary Facilities and Controls

Z1050.10 Temporary Utilities

Temporary Power: By electrical sub-contractor. Owner will pay backcharges for connection to utility company, as this information is usually not available to bidders at the time bids are due.

Temporary Water: By plumbing sub-contractor. Cost of backcharge (charge for connecting to utility company lines) will be included in the plumbing sub-contract price.

Temporary Sewer: By site sub-contractor, for re-routing around new building.

Temporary Drainage: By site sub-contractor, for re-routing around new building.

Temporary Gas: By utility company, for re-routing around new building. Owner will pay backcharges for installation to utility company, as this information is usually not available to bidders the time bids are due.

Z1050.20 Construction Facilities

Contractor will be responsible for field offices.

Z1050.30 Construction Aids

- **Scaffolding and Staging:** Contractor shall furnish, erect, and maintain exterior and interior staging and scaffolding required to be over 8' high for use without charge by each Trade-Bidder as needed by them for proper execution of their work. Staging and scaffolding less than 8 feet high shall be provided by each Trade-Bidder for its own use.
- **Hoists and Cranes:** Hoisting equipment and machinery required at heights 8 feet and above shall be furnished, installed, operated and maintained by the General Contractor for the use of all Subcontractors' material and equipment, except where otherwise specified in each Trade-Bid Section. Hoisting equipment necessary for under 8 feet shall be by the subcontractor.

Z1050.35 Temporary Vehicular Access and Parking

Contractor will enter and leave the site from a single location, which will be designated by the Owner and shown on the Drawings.

Z1050.40 Temporary Barriers and Enclosures

Contractor will be required to provide a site fence to secure the site, with a locking gate at the entrance to the site.

Z1050.50 Temporary Controls

Environmental Protection, General: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result.

Existing Hazardous Materials: Refer to Section F of this document for precautions during abatement and handling of asbestos containing materials, lead-based paint and other hazardous materials which may be present in and on surfaces of the existing buildings.

Erosion Control: Refer to Section G for a description of erosion and sediment control to be placed on the site and maintained during demolition and construction.

Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result.

Outdoor Air Quality Control: Provide adequate means for containing dust and debris generated by construction operations.

Indoor Air Quality Contaminant Containment and Control: Develop and enforce temporary procedures for preventing demolition and construction activities from

creating unacceptable IAQ within occupied areas and new construction during each phase.

- Existing Building: Prior to any construction activity beginning, the Contractor shall mount minimum MERV 13 filters on the intakes of all the existing wall or areaway intakes for ventilation air equipment, to prevent construction and demolition debris and dust from entering the new HVAC systems. The filters shall be replaced periodically, minimum once a week or more frequently as needed. If necessary, provide a sheet metal plenum box with filter cartage, minimum MERV 13. The plenum shall be mounted on the face of the ventilation air equipment intake louvers. The plenum box shall be sealed watertight to the intake louver. The plenum box shall have a 45-degree weather shield to prevent water carry to the filter. The plenum box shall be mounted on intake louvers facing the construction site as well as adjacent ventilation air equipment intake louvers which will also have the potential of carrying in construction debris and dust.
- New Building: Prior to the demolition of the existing building, the General Contractor shall mount minimum MERV 13 filters on the intakes of all the roof top equipment, to prevent construction and demolition debris and dust from entering the new HVAC systems. The filters shall be replaced periodically, minimum once a week or more frequently as needed.
- IAQ Monitoring: Provide IAQ monitoring, conducted by Contractor's IAQ Consultant during all phases of construction and demolition.
 - 1) Before Construction Baseline Survey: Prior to the start of construction, conduct baseline IAQ survey in existing building to determine the background levels of air contaminants normally present inside occupied areas and building exterior. Provide complete survey, including sufficient number of rooms and spaces to be representative of entire occupied area. Baseline assessment shall include evaluations of factors as recommended by the IAQ Consultant, including comfort factors (temperature, relative humidity, carbon monoxide, and carbon dioxide), background respirable particulates, mold, moisture, and total VOCs.
 - 2) Before Demolition Baseline Survey: Prior to the start of demolition, conduct baseline IAQ survey in new building to determine the background levels of air contaminants normally present inside new construction areas and building exterior. Provide complete survey, including sufficient number of rooms and spaces to be representative of entire project area. Baseline assessment shall include evaluations of factors as recommended by the IAQ Consultant, including comfort factors (temperature, relative humidity, carbon monoxide, and carbon dioxide), background respirable particulates, mold, moisture, and total VOCs.
 - 3) Monthly Routine Monitoring: Perform monthly monitoring to determine levels of air contaminants present in new building spaces, with particular attention paid to the portion of the building immediately adjacent to demolition and construction activities.

4)**Noise Control:** Develop and maintain a noise-abatement program to minimize disturbances to school activities and other buildings adjacent to the site.

Waste Disposal: In accordance with local regulations and with the approved Waste Management Plan.

Temporary Partitions: Temporary dust and sound partitions within the building to allow construction within an ongoing operating school.

Z1050.70 Project Identification

The Contractor will be required to provide a project sign in accordance with MSBA requirements.

Z1060 Product Requirements

Z1060.10 Common Product Requirements

Products that are manufactured in Massachusetts or “Made in the USA” are preferred.

Z1070 Execution and Closeout Requirements

Z1070.30 Cleaning and Waste Management

The Contractor is required to complete the cleaning operations before requesting inspection for certification of Substantial Completion.

After the punch list work has been completed, as a prerequisite to Final Acceptance of the Work, reclean the entire building and grounds.

Z1070.40 Starting and Adjusting

As a prerequisite to Substantial Completion, Contractor will start up each piece of equipment and make adjustments necessary to insure that equipment is performing to specifications.

At the completion of the Project, Contractor will instruct Owner' personnel in operation and maintenance procedures for equipment furnished under this Contract.

Z1070.70 Closeout Submittals

Certified record survey showing property line, foundation locations, and finished floor elevations.

Certificates of inspection including:

Certificate of Occupancy

Certificate of inspection for elevators

Certificate of inspection for mechanical work

Certificate of inspection for electrical work

Reports of equipment start-up, testing and balancing.

Change-over information related to Owner's occupancy, use, operation and maintenance, including final meter readings, if applicable.

Change-over from construction keying to final keying.

Consent of surety to payment at the time of Substantial Completion.

Completed project Operation and Maintenance Manuals.

Record of training of Owner's personnel; training videos if required.

Contractor's project warranty.

Project Record Documents: Record Drawings, Record Specifications, Shop Drawings.

Contractor-prepared Submittals required for LEED Certification.

When the Contractor believes that the work is substantially complete, including the closeout submittals, the Contractor will notify the Architect in writing and request inspection. Prior to requesting this inspection, the Contractor will prepare a list of work still incomplete ("punch list") and attach this list to the request for inspection.

The Architect will make an inspection to determine whether the work is Substantially Complete and in accordance with the Contract Documents and, if it is, will issue the Certificate of Substantial Completion.

Z1070.80 Demonstration and Training

Record of training of Owner's personnel and training videos, as required.

Z1090 Life Cycle Activities

Z1090.10 Commissioning/LEED Certification Requirements

Construction Waste Management Plan: Pursuant to LEED V4 Materials and Resource Credit, Contractor will be required to develop and enforce a construction waste management plan that will recover 75% of construction waste materials that would otherwise go into landfill. Document the successful implementation of the waste management plan for the LEED Submittal.

Construction IAQ Management Plan: Pursuant to LEED Indoor Environmental Quality Credit, Contractor will be required to develop and enforce a construction indoor air quality management plan which will describe procedures to be implemented during construction and then prior to occupancy to ensure that indoor air quality meets

referenced standards when the Owner occupies the building. Document successful implementation of the plan for the LEED Submittal.

This plan will include either general building flush-out just prior to occupancy, or air testing after construction ends, followed by selective flush-out in areas in which contaminant concentrations exceeds permitted maxima.

LEED Credit: Pursuant to LEED Energy and Atmosphere, Fundamental Building Systems Commissioning, and Energy and Atmosphere Credit, Additional Commissioning, a third party agent will perform commissioning work for this project.

Massachusetts School Building Authority (MSBA) and LEED require, as a minimum, fundamental building systems commissioning to determine that that the building's energy related systems are installed, calibrated and perform according to the District's project requirements, basis of design, and construction documents.

The MSBA will assign a Commissioning Agent to the Project.

Third Party Commissioning: The LEED scorecard for this project requires fundamental and enhanced building systems commissioning to determine that that the building's energy related systems are installed, calibrated and perform according to the owner's project requirements, basis of design, and construction documents.

Minimum commissioning should cover the following energy-related systems:

- Heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls.
- Lighting and daylighting controls.
- Domestic hot water systems.
- Renewable energy systems, if any (wind, solar etc.).

Enhanced Commissioning: The commissioning process (and its benefits to subsequent performance of the building) can be enhanced by beginning the commissioning process early during the design process and executing additional activities after systems performance verification is completed. Enhancements might include:

- Have the Commissioning Agent review the Owner's project requirements, basis of design, and design documents prior to 50% completion of drawings and specifications, and back-check the review comments in the next design submission.
- During construction, concurrent with architect's review, have the Commissioning Agent review contractor submittals applicable to systems being commissioned for compliance with the Owner's project requirements and basis of design.
- Develop a systems manual that provides future operating staff the information needed to understand and optimally operate the commissioned systems.
- Verify that the requirements for training operating personnel and building occupants are completed.

- Within 10 months after substantial completion, have the commissioning agent participate in a review of building operation with O&M staff and occupants. Include a plan for resolution of outstanding commissioning related issues.

Commissioning will also include verification of thermal and air barrier performance of the building envelope.

The Owner will direct its Testing and Inspection Agency to inspect and test building envelope components as they are installed.

The Contractor will provide Whole Building Air Infiltration System which will include the following:

- Perform whole building air infiltration testing to quantify air leakage and determine if the as-built construction achieved the required air infiltration target.
- Use infrared technology to survey exterior walls and identify areas with thermal anomalies, including discontinuous insulation and air leakage.
- Survey the roof and use infrared technology to identify roof areas with wet insulation that needed to be repaired prior to substantial completion.

Z70 PERMITS, INSURANCE AND BONDS

Z7050.10 Site Permits

The following permits and approvals will be required for this project; except where noted as Contractor's responsibility, obtaining these permits and approvals will be the responsibility of the Owner, assisted by SMMA.

- Notice of Intent from the Town of East Longmeadow Conservation Commission and MA DEP.
- Site Plan Review and Special Permit for Earth Moving Operations from the Town of East Longmeadow Planning Board.
- EPA NPDES NOI for construction activities
- Permit for Curb Cut, Water and Sewer Services from the Town of East Longmeadow Department of Public Works.
- Trench permit from the Town of East Longmeadow Department of Public Works. (Obtained by the Contractor.)

An Environmental Notification Form (ENF) is not required for this project.

Z7050.20 Building Permits

The Contractor will be required to obtain all permits necessary for this Project, including but not limited to the building permit and permits pertaining to mechanical and electrical work. The awarding authority is expected Town of East Longmeadow to waive the fees for permits issued by the Town.

Z7050.30 Insurance

Contractor will be required to carry workman's compensation, and other statutory insurance which is required by the Commonwealth of Massachusetts.

Contractor will also be required to purchase and maintain, for the duration of the project, Liability Insurance in the form and in amounts to be specified by the Owner.

Z7070 Bond Fees

Z7070.10 Bonds

Contractor will be required to provide a performance bond and a payment bond, each in the amount of 100% of the Contract Price.

Trade Contract sub-contractors will be required to provide performance and payment bonds, each in the amount of 100% of their respective contracts.

SECTION 018113.14 – SUSTAINABLE DESIGN REQUIREMENTS - LEED v4 BD+C: SCHOOLS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The Contractor, Subcontractors, and/or suppliers providing goods or services referenced in or related to this Section shall also be bound by the Documents identified in Division 01 Section “Summary”, Paragraph 1.1A, entitled “Related Documents.”

1.02 SUMMARY

- A. Section includes general requirements and procedures for compliance with certain prerequisites and credits needed for Project to obtain "LEED Version 4 for Building Design and Construction: Schools" (LEED v4 BD+C) Silver certification based on USGBC's LEED v4 BD+C: Schools.
 - 1. Specific requirements for LEED v4 are also included in other Sections.
 - 2. Some LEED v4 prerequisites and credits needed to obtain LEED v4 certification depend on product selections and may not be specifically identified as LEED v4 requirements. Compliance with requirements needed to obtain LEED v4 prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
 - 3. This Project is committed to meeting the prerequisites and qualifying for the points indicated on the project scorecard.
 - 4. A copy of the LEED v4 Project checklist is attached at the end of this Section for information only.
 - a. Some LEED v4 prerequisites and credits needed to obtain the indicated LEED v4 certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.
 - 5. Definitions included in the "LEED Version 4 for Building Design and Construction" (LEED v4 BD+C) Reference Guide and online amendments apply to this Section.
 - 6. Whole building testing to comply with the IECC 2021 energy code, including amendments of the Massachusetts Stretch code, and the Massachusetts Specialized Code, and testing in accordance with ASTM E3158.
- B. Related Requirements:
 - 1. Divisions 01 through 48 Sections for LEED requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.
 - 2. Section 01 32 33, "Photographic Documentation."
 - 3. Section 01 33 00, "Submittal Procedures."
 - 4. Section 01 50 50, "Temporary Facilities and Controls" for erosion and sedimentation control during construction.
 - 5. Section 01 50 60, "Temporary Heating, Ventilating and Moisture Control" for dust control and moisture and mold control during construction.
 - 6. Section 01 74 19, "Construction Waste Management and Disposal" for waste collection, diversion, and disposal, record-keeping and reporting during construction.

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7. Section 01 91 13 "General Commissioning Requirements" for building commissioning that is a prerequisite for LEED compliance.

1.03 DEFINITIONS

- A. **Bio-Based Materials:** Materials that meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials shall be tested using ASTM D 6866 and be legally harvested, as defined by the exporting and receiving country.
- B. **CDPH Standard Method v1.1:** California Department of Public Health (CDPH) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, v. 1.1–2010, for the emissions testing and requirements of products and materials.
- C. **Chain-of-Custody Certificates:** Certificates signed by manufacturers and fabricators certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001., "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
- D. **Environmental product declaration EPD** is a statement that the item meets the environmental requirements of ISO 14021-1999, ISO 14025-2006 and ISO 21930-2007.
- E. **LEED v4:** USGBC's "LEED Version 4 for Building Design and Construction."
 1. Definitions that are a part of "LEED Version 4 for Building Design and Construction" (LEED v4 BD+C) apply to this Section.
- F. **Life cycle assessment** is an evaluation of the environmental effects of a product from cradle to grave, as defined by ISO 14040-2006 and ISO 14044-2006.
- G. **Composite Wood and Agrifiber:** Products made of wood particles and/or plant material pressed and bonded with adhesive or resin such as particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates, and door cores.
- H. **Corporate Sustainability Report:** A third-party verified report that outlines the environmental impacts of extraction operations and activities associated with the manufacturer's product and the product's supply chain.
- I. **Environmental Product Declaration (EPD):** An independently verified report based on life-cycle assessment studies that have been conducted according to a set of common rules for each product category and peer-reviewed.
 1. **Product-Specific Declaration:** A product with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that has at least a cradle to gate scope.
 2. **Industry-Wide (Generic) EPD:** Provide products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator. EPD must conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.
 3. **Product-Specific Type III EPD:** A product with a third-party certification, including external verification, in which the manufacturer is explicitly recognized by the program

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operator. EPD must conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.

- J. Extended Producer Responsibility (EPR): Measures undertaken by the maker of a product to accept its own and sometimes other manufacturers' products as postconsumer waste at the end of the products' useful life.
- K. Health Product Declaration Open Standard (HPD): A standard format for reporting product content and associated health information for building products and materials.
- L. Indoor Air Quality (IAQ) Management Plan: Plan developed by the Contractor to provide a healthy indoor environment for workers and building occupants during construction. Plan must meet or exceed the recommendations of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "IAQ Guidelines for Occupied Buildings Under Construction."
- M. Leadership Extraction Practices: Products that meet at least one of the responsible extraction criteria, which include: extended producer responsibility; bio-based materials; FSC wood products; materials reuse; recycled content; and other USGBC approved programs.
- N. Material Cost: The dollar value of materials being provided to the site, after Contractor mark-ups, including transportation costs, taxes, fees, and shop labor, but excluding field equipment and field labor costs.
- O. Materials Reuse: Reuse includes salvaged, refurbished, or reused products.
- P. Multi-Attribute Optimization: Third party certified products that demonstrate impact reduction below industry average in at least three of the following six categories: global warming potential; stratospheric ozone depletion; acidification; eutrophication; tropospheric ozone creation; nonrenewable resource depletion.
- Q. Recycled Content: Recycled content is the sum of postconsumer recycled content plus one-half the preconsumer recycled content, based on cost. The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
 - 1. "Postconsumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
 - 2. "Preconsumer" material is defined as material diverted from the waste stream during the manufacturing process. Reutilization of materials (such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it) is excluded.
- R. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles of Project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.
- S. Solar Reflectance Index (SRI): The measure of a constructed surface's ability to stay cool in the sun by reflecting solar radiation and emitting thermal radiation. SRI values range from zero (solid

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black surface) to 100 (solid white surface). SRI value of a material is calculated according to ASTM E1980 and based on the aged tested values of solar reflectance and thermal emittance.

- T. Vertical Illuminance: Illuminance levels calculated at a point on a vertical surface or plane.
- U. Volatile Organic Compounds (VOC) Emissions Test: Refer to CDPH Standard Method v1.1 definition.

1.04 SCORECARD CATEGORIES AND ABBREVIATIONS

- A. Credit abbreviation types.
 - 1. Prerequisite (p).
 - 2. Credit (c).
- B. Location and Transportation (LT): Credits 1 through 8.
- C. Sustainable Sites (SS): Prerequisites 1 through 2, Credits 1 through 8.
- D. Water Efficiency (WE): Prerequisites 1 through 3, Credits 1 through 4.
- E. Energy and Atmosphere (EA): Prerequisites 1 through 4, Credits 1 through 7.
- F. Materials and Resources (MR): Prerequisites 1 through 2, Credits 1 through 5.
- G. Indoor Environmental Quality (IEQ): Prerequisites 1 through 2, Credits 1 through 9.
- H. Innovation (I): Credits 1 through 2.
- I. Regional Priority (RP): Credits 1 through 4.

1.05 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site. Review LEED v4 requirements and action plans for meeting requirements.

1.06 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the USGBC regarding LEED v4 credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until the USGBC has made its determination on the Project's LEED v4 certification application. Document responses as informational submittals.
- B. Submit documentation to USGBC and respond to questions and requests from USGBC regarding LEED v4 credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until the USGBC has made its determination on the Project's LEED v4 certification application.
 - 1. Document correspondence with USGBC as informational submittals.

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- C. Work of this project includes completed building and application for LEED certification. The Contractor shall become familiar with LEED criteria, documentation requirements, and credits identified for this project before procurement and construction commences. Work is not complete until Owner has accepted USGBC's final review of LEED certification.
- D. Provide materials and procedures necessary to obtain LEED prerequisites and credits required in this Section. Numerous sections identify specific requirements that contribute to LEED credits. The Contractor is responsible to maximize procurement of products, materials, and procedures that obtain these prerequisites and credits, even if the section does not specifically reference LEED.
- E. Respond to questions and requests for additional information from Architect, the U.S. Green Building Council (USGBC), the Green Building Certification Institute (GBCI) and the Massachusetts School Building Authority (MSBA) regarding LEED credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until the GBCI has made its determination on the project's LEED certification application. LEED Online Submittals: Upload LEED documentation submittal data directly to USGBC project "LEED Online" website. Complete online forms at least monthly and as necessary to document LEED credits for submittals required in this Section.
- F. Incorporate LEED v4 BD+C for Schools requirements in subcontractors and suppliers contracts ensuring that the LEED project requirements will be met.
- G. LEED Conference: Schedule and conduct a conference at a time convenient to Owner and Architect within 21 days prior to Notice to Proceed. Advise Architect, Commissioning Authority, and Owner's Project Manager of scheduled meeting dates.
 - 1. Attendees: Authorized representatives of Owner, Commissioning Authority, Owner's Project Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss LEED goals and plans for the project, submittal procedures and Contractor's action plan for achieving and documenting applicable LEED prerequisites and credits, and discussion of targeted LEED Prerequisites and Credits.
 - 3. Minutes: Record and distribute minutes to attendees and other entities with responsibilities for obtaining LEED Credits.
- H. Photographic Documentation of the Indoor-Air-Quality Management Measures: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials. Submit to Architect independent of LEED requirements.

1.07 ACTION SUBMITTALS

- A. General: Submit additional LEED submittals required by other Specification Sections.

B. LEED submittals are in addition to other submittals.

1. If submitted item is identical to that submitted to comply with other requirements, include an additional copy with other submittal as a record copy of compliance with indicated LEED v4 requirements instead of separate LEED submittal. Mark additional copy "LEED submittal."

C. LEED Documentation Submittals:

1. MRc2, Building Product Disclosure and Optimization: Environmental Product Declarations complying with LEED v4 requirements.
2. EA p3, Building-Level Energy Metering: Product data for meters, sensors, and data collection system used to provide continuous metering of building energy-consumption performance.
3. MRp2/MRc5, Construction and Demolition Waste Management: Comply with submittal requirements of Section 01 74 19 "Construction Waste Management and Disposal."

Documentation complying with Division 01 Section "Construction Waste Management and Disposal."

4. MRc3, Building Product Disclosure and Optimization, Raw Materials: Option 1, Raw Material Source and Extraction Reporting.
Documentation for products that comply with LEED v4 requirements for multi-attribute optimization.
 - a. Include documentation for regional materials, indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material and costs of regional materials.
5. Documentation for products that comply with LEED v4 requirements for leadership extraction practices. Include the following:
MRc3, Building Product Disclosure and Optimization, Sourcing of Raw Materials: Option 2, Leadership Extraction Practices.
 - a. Extended Producer Responsibility: Product data and certification letter from product manufacturers, indicating participation in an extended producer responsibility program and statement of costs.
 - b. Bio-Based Materials: Product data and certification for bio-based materials, indicating that they comply with requirements. Include statement of costs.
 - c. Certified Wood: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
 - d. Materials Reuse: Receipts for salvaged and refurbished materials used for Project, indicating sources and costs.
 - e. Environmental product data EPD for all applicable items
 - f. Recycled Content: Product data and certification letter from product manufacturers, indicating percentages by weight of postconsumer and preconsumer recycled content for products having recycled content. Include statement of costs.
6. MRc4, Building Product Disclosure and Optimization, Material Ingredients: Option 1, Material Ingredient Reporting.

Material ingredient reports for products that comply with LEED v4 requirements for material ingredient reporting., including but not limited to the following:

- Documentation for products that comply with LEED v4 requirements for material ingredient optimization.
- 1) Manufacturer Inventory.
 - 2) Health Product Declaration.
 - 3) Cradle to Cradle certifications.
 - 4) Declare product labels.
7. MRc4, Building Product Disclosure and Optimization, Material Ingredients: Option 2, Material Ingredient Optimization.
- a. Documentation for products that comply with LEED v4 requirements for material ingredient optimization, including but not limited to the following:
 - 1) GreenScreen Benchmarks.
 - 2) Cradle to Cradle certifications.
 - 3) REACH optimizations.
8. EQp2/EQc3/EQc4, Indoor Air Quality: Comply with submittal requirements for product manufacturer supply chain optimization of Section 01 57 33, "Temporary Indoor Air Quality Control."
- a. Include documentation for regional materials, indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material and costs of regional materials.
9. EQc2, Low-Emitting Materials: Product data for adhesives and sealants used inside the weatherproofing system, indicating VOC content and emissions testing documents showing compliance with requirements for low-emitting materials, for the following materials:
- a. Paints and Coatings
 - b. Adhesives and sealants
 - c. Flooring
 - d. Products containing composite wood or agrifiber products or wood glues.
 - e. Ceilings, walls, thermal, and acoustic insulation.
 - f. Exterior applied materials.
10. Product data for paints and coatings used inside the weatherproofing system, indicating VOC content showing compliance with requirements for low-emitting materials.
11. Green Label Plus and / or FloorScore certification for flooring, indicating compliance with requirements for low-emitting materials.
12. Laboratory test reports for products containing composite wood or agrifiber products or wood glues, indicating compliance with requirements for low-emitting materials.
13. Manufacturer supplied documentation of compliance for ceilings, walls, and thermal, and acoustic insulation, indicating compliance with requirements for low-emitting materials.
- a. Thermal insulation must also document proof of formaldehyde free ingredients.
14. Construction Indoor-Air-Quality (IAQ) Management:
- a. Construction IAQ management plan.
 - b. Product data for MERV 8 temporary filtration media.
 - c. Product data for MERV 13 filtration media used during occupancy.
 - d. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the FIVE SMACNA approach employed, documenting implementation of the IAQ management measures.
 - 1) HVAC protection

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- 2) Source control
- 3) Pathway interruption
- 4) Housekeeping
- 5) Scheduling

15. IAQ Assessment:

- a. Signed statement describing the building air flush-out procedures, including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out. Provide CFM calculations for pre- and post-occupancy flush out.
- b. Product data for MERV 13 filtration media used during flush-out and occupancy.
- c. Report from testing and inspecting agency indicating results of IAQ testing and documentation showing compliance with IAQ testing procedures and requirements.
- d. Flush out plan including methods for maintaining temperature of 60 deg F to 80 deg F and relative humidity below 60 percent throughout flush out period.

D. MA 225 CMR 23 - Massachusetts Stretch Energy Code amendments (to IECC 2021) Submittals:

1. ASTM E3158 Whole Building Air Infiltration testing report.
 - a. Field test installed air barrier system components as directed by Building Envelope Commissioning Agent, in accordance with IEC requirements and ASTM E1358 and E3158. Tests include:
 - 1) Tests of air pressure shall be conducted at a difference of 1.57 psf.:No indication of leaks.
 - 2) Smoke tests.
 - 3) Leak detection, liquid.
 - 4) Air infiltration: Whole Building Air Infiltration; Testing goal 0.15 cfm/sf @75 PA.
 - 5) Water infiltration.
 - 6) Blower door testing.

1.08 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For LEED v4 coordinator, provide current LEED AP or LEED GA certificate.
- B. Project Materials Cost Data: Provide statement indicating total cost for materials used for Project. Costs exclude labor, overhead, and profit. Include breakout of costs for the following categories of items:
 1. Plumbing.
 2. Mechanical.
 3. Electrical.
 4. Specialty items, such as elevators and equipment.
 5. Wood construction materials.
 6. Passive plumbing materials.
 7. Passive mechanical (HVAC) materials.
 8. Passive electrical materials.
 9. Earthwork and exterior improvements, hard costs.

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- C. LEED Action Plans: Provide preliminary submittals within 14 days of date established for the Notice to Proceed, indicating how the following requirements will be met:
1. List of proposed products with Environmental Product Declarations.
 2. List of proposed products complying with requirements for multi-attribute optimization.
 3. List of proposed products complying with requirements for raw material and source extraction reporting.
 4. List of proposed products complying with requirements for leadership extraction practices.
 5. List of proposed products complying with requirements for material ingredient reporting.
 6. List of proposed products complying with requirements for material ingredient optimization.
 7. List of proposed products complying with requirements for product manufacturer supply chain optimization.
 8. LEED Pre-requisites: Site Assessment and Construction Activity Pollution Prevention plans for Temporary Facilities.
 9. MRp2/MRc5, Waste management plan complying with Section 017419 "Construction Waste Management and Disposal."
 10. Construction IAQ management plan.
 11. EQp2/EQ3/EQ4, Indoor air quality plan, complying with Section 01 57 33, "Temporary Indoor Air Quality Control."
- D. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans. for the following:
1. Include Construction Waste Management Report in the LEED progress report. MRp2/MRc5, Waste reduction progress reports complying with Section 01 74 19 "Construction Waste Management Report and Disposal."
 2. MRc2, Building product disclosure and optimization – environmental product declarations.
 3. MRc3, Building product disclosure and optimization – sourcing of raw materials.
 - a. General: Manufacturing locations.
 - 1) Extended producer responsibility.
 - 2) Bio-based materials.
 - 3) Certified wood products.
 - 4) Materials reuse.
 - 5) Recycled content.
 4. MRc4, Building product disclosure and optimization – material ingredients.
 5. EQc2, Low emitting materials.
 6. Low Emitting Materials Tracking Sheet monitoring the project's progress towards targeted LEED Indoor Environmental Quality Credits. Tracking Sheet to be presented at construction meetings.
 7. EQc3, Indoor air quality, during construction, complying with Section 01 57 33, "Temporary Indoor Air Quality Control."
 8. EQc4, Indoor air quality assessment, complying with Section 01 57 33, "Temporary Indoor Air Quality Control."

1.09 QUALITY ASSURANCE

- A. LEED Coordinator: Engage an experienced LEED accredited professional to coordinate LEED v4 requirements. LEED v4 coordinator may also serve as waste management coordinator.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide products and procedures necessary to obtain LEED v4 credits required in this Section. Although other Sections may specify some requirements that contribute to these LEED v4 credits, the Contractor shall provide additional materials and procedures necessary to obtain LEED v4 credits indicated.
- B. At least 20 different products from at least five different manufacturers shall have type III Environmental Product Declarations (EPDs).
 - 1. If Type III EPDs are not available, provide at least 40 different products from at least five different manufacturers that have industry-specific (generic) EPDs.
- C. Exclusions: Special equipment, such as elevators, escalators, process equipment, and fire suppression systems, is excluded from the credit calculations. Also excluded are products purchased for temporary use on the project, like formwork for concrete.

2.02 BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION

- A. MRc2, Building Product Disclosure and Optimization, Environmental Product Declarations: Option 1. Provide at least 20 permanently installed products (sourced from at least 5 different manufacturers) which meet one of the disclosure criteria:
 - 1. Product-Specific Declaration: Valued as one quarter (1/4) of a product.
 - 2. Industry-Wide (Generic) EPD: Valued as one half (1/2) of a product.
 - 3. Product-Specific Type III EPD: Valued as one whole product.
- B. At least 20 different products from at least five different manufacturers shall have type III Environmental Product Declarations (EPDs).
 - 1. If Type III EPDs are not available, provide at least 40 different products from at least five different manufacturers that have industry-specific (generic) EPDs.
- C. At least 20 different products from at least five different manufacturers with documented participation in an Extended Producer Program.
 - 1. Sources for these programs can be found at www.productstewardship.us.
- D. At least 20 different products from at least five different manufacturers that have documented compliance with any one of the following:
 - 1. Chemical Abstract Service Registration Number (CASRN)
 - 2. Cradle to Cradle Certified
 - 3. Health Product Declaration (HPD)
- E. Recycled Content: Building materials shall have recycled content such that postconsumer recycled content plus one-half quarter (1/4) of preconsumer recycled content for Project constitutes a minimum of <Insert number> percent of cost of materials used for Project.

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1. Cost of postconsumer recycled content plus one-half of preconsumer recycled content of an item shall be determined by dividing weight of postconsumer recycled content plus one-half of preconsumer recycled content in the item by total weight of the item and multiplying by cost of the item.
 2. Do not include plumbing, mechanical and electrical components, and specialty items, such as elevators and equipment, in the calculation.
- F. MRc3, Building Product Disclosure and Optimization, Sourcing of Raw Materials: Option 2, Leadership Extraction Practices. Provide products that meet at least one of the responsible extraction criteria below for at least 25%, by cost, of the total value of permanently installed building products in the project:
1. Extended producer responsibility program.
 2. Bio-based materials.
 3. Certified Wood: Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:
 - a. Rough carpentry.
 - b. Miscellaneous carpentry.
 - c. Heavy timber construction.
 - d. Wood decking.
 - e. Metal-plate-connected wood trusses.
 - f. Structural glued-laminated timber.
 - g. Finish carpentry.
 - h. Architectural woodwork.
 - i. Wood paneling.
 - j. Wood veneer wall covering.
 - k. Wood flooring.
 - l. Wood lockers.
 - m. Wood cabinets.
 - n. Furniture.
 4. Recycled content.
 - a. Exceptions: Do not include fire protection, operational plumbing, operational mechanical, and operational electrical components, and specialty items, such as elevators and equipment, in the calculation.
- G. Certified Wood: Not less than <Insert number> percent, by cost, of wood-based materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001.
- H. MRc4, Building Product Disclosure and Optimization, Material Ingredients: Option 1, Material Ingredient Reporting.
1. Use at least 20 different permanently installed products from at least five different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm), which meet one of the following disclosure criteria:
 - a. Manufacturer Inventory.
 - b. Health Product Declarations (HPDs).
 - c. Cradle to Cradle (C2C) certifications.
 - d. Declare product labels.
 - e. ANSI/BIFMA e3 Furniture Sustainability Standard.

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- I. MRc4, Building Product Disclosure and Optimization, Material Ingredients: Option 2, Material Ingredient Optimization.
 - 1. Use products that document their material ingredient optimization using the paths below for at least 25%, by cost, of the total value of permanently installed products in the project, which meet one of the following disclosure criteria:
 - a. GreenScreen benchmarks.
 - b. Cradle to Cradle certifications.
 - c. REACH optimizations.

2.03 LOW-EMITTING MATERIALS

- A. EQc2, Low-Emitting Materials, General Emissions Requirements: Products must demonstrate they have been tested and determined compliant in accordance with California Department of Public Health, (CDPH), Standard Method v1.1-2010, using the applicable exposure scenario. Manufacturer’s documentation demonstrating compliance must state the range of total VOCs (tVOC) after 14 days measured as specified in the CDPH Standard Method v1.1 as follows:
 - 1. 0.5mg/m3 or less,
 - 2. between 0.5 and 5.0 mg/m3 or,
 - 3. 0.50 mg/m3 or more.

- B. EQc2, Low-Emitting Materials, Paints and Coatings: All paints and coatings wet-applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.

Flat

Product Type:	Allowable VOC Content (g/L):
Bond Breaker	350
Clear wood finishes - Varnish	275
Clear wood finishes – Sanding Sealer	275
Clear wood finishes - Lacquer	275
Colorant – Architectural Coatings, excluding IM coatings	50
Colorant – Solvent Based IM	600
Colorant - Waterborne IM	50
Concrete – Curing compounds	100
Concrete – Curing compounds for roadways & bridges	350
Concrete surface retarder	50
Driveway Sealer	50
Dry-fog coatings	50
Faux finishing coatings - Clear topcoat	100
Faux finishing coatings – Decorative Coatings	350
Faux finishing coatings - Glazes	350
Faux finishing coatings - Japan	350
Faux finishing coatings – Trowel applied coatings	50
Fire-proof coatings	150
Flats	50
Floor coatings	50
Form release compounds	100
Graphic arts (sign) coatings	150

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Product Type:	Allowable VOC Content (g/L):
Industrial maintenance coatings	100
Industrial maintenance coatings – High temperature IM coatings	420
Industrial maintenance coatings – Non-sacrificial anti-graffiti coatings	100
Industrial maintenance coatings – Zinc rich IM primers	100
Magnesite cement coatings	450
Mastic coatings	100
Metallic pigmented coatings	150
Multi-color coatings	250
Non-flat coatings	50
Pre-treatment wash primers	420
Primers, sealers and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Roof coatings, aluminum	100
Roof primers, bituminous	350
Rust preventative coatings	100
Stone consolidant	450
Sacrificial anti-graffiti coatings	50
Shellac- Clear	730
Shellac – Pigmented	550
Specialty primers	100
Stains	100
Stains, interior	250
Swimming pool coatings – repair	340
Swimming pool coatings – other	340
Traffic Coatings	100
Waterproofing sealers	100
Waterproofing concrete/masonry sealers	100
Wood preservatives	350
Low solids coatings	120

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Industrial Maintenance Coatings: 100 g/L.
6. Rust-Preventive Coatings: 100 g/L.
7. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
8. Clear Wood Finishes, Varnishes: 275 g/L.
9. Clear Wood Finishes, Lacquers: 275 g/L.
10. Floor Coatings: 50 g/L.
11. Shellacs, Clear: 730 g/L.
12. Shellacs, Pigmented: 550 g/L.
13. Stains: 100 g/L.
14. Waterproofing Sealers: 100 g/L.

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- A. EQc2, Low-Emitting Materials, Adhesives, and Sealants: For field applications that are inside the weatherproofing system, adhesives and sealants shall comply with VOC content limits of the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
1. Wood Glues: 30 g/L.
 2. Metal-to-Metal Adhesives: 30 g/L.
 3. Adhesives for Porous Materials (Except Wood): 50 g/L.
 4. Subfloor Adhesives: 50 g/L.
 5. Plastic Foam Adhesives: 50 g/L.
 6. Carpet Adhesives: 50 g/L.
 7. Carpet Pad Adhesives: 50 g/L.
 8. VCT and Asphalt Tile Adhesives: 50 g/L.
 9. Cove Base Adhesives: 50 g/L.
 10. Gypsum Board and Panel Adhesives: 50 g/L.
 11. Rubber Floor Adhesives: 60 g/L.
 12. Ceramic Tile Adhesives: 65 g/L.
 13. Multipurpose Construction Adhesives: 70 g/L.
 14. Fiberglass Adhesives: 80 g/L.
 15. Contact Adhesives: 80 g/L.
 16. Structural Glazing Adhesives: 100 g/L.
 17. Wood Flooring Adhesives: 100 g/L.
 18. Structural Wood Member Adhesives: 140 g/L.
 19. Single-Ply Roof Membrane Adhesives: 250 g/L.
 20. Special-Purpose Contact Adhesives (That Are Used to Bond Melamine-Covered Board, Metal, Unsupported Vinyl, Rubber, or Wood Veneer 1/16 Inch or Less in Thickness to Any Surface): 250 g/L.
 21. Top and Trim Adhesives: 250 g/L.
 22. Plastic Cement Welding Compounds: 250 g/L.
 23. ABS Welding Compounds: 325 g/L.
 24. CPVC Welding Compounds: 490 g/L.
 25. PVC Welding Compounds: 510 g/L.
 26. Adhesive Primer for Plastic: 550 g/L.
 27. Sheet-Applied Rubber Lining Adhesives: 850 g/L.
 28. Aerosol Adhesive, General-Purpose Mist Spray: 65 percent by weight.
 29. Aerosol Adhesive, General-Purpose Web Spray: 55 percent by weight.
 30. Special-Purpose Aerosol Adhesives (All Types): 70 percent by weight.
 31. Other Adhesives: 250 g/L.
 32. Architectural Sealants: 250 g/L.
 33. Nonmembrane Roof Sealants: 300 g/L.
 34. Single-Ply Roof Membrane Sealants: 450 g/L.
 35. Other Sealants: 420 g/L.
 36. Sealant Primers for Nonporous Substrates: 250 g/L.
 37. Sealant Primers for Porous Substrates: 775 g/L.
 38. Modified Bituminous Sealant Primers: 500 g/L.
 39. Other Sealant Primers: 750 g/L.
- B. EQc2, Low-Emitting Materials, Adhesives and Sealants: For field applications, use adhesives and sealants that comply with the limits for VOC content when calculated according to South Coast

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Air Quality Management District (SCAQMD) Rule #1168, requirements in effect on July 1, 2005, and rule amendment date January 7, 2005:

Architectural Applications:	Allowable VOC Content (g/L):
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Specialty Applications:	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Computer diskette manufacturing	350
Contact adhesive	80
Special purpose contact adhesive	250
Tire retread	100
Adhesive primer for traffic marking tape	150
Structural wood member adhesive	140
Sheet applied rubber lining operations specialty	850
Top and Trim adhesive	250
Substrate Specific Applications:	
Metal to metal substrate specific adhesives	30
Plastic foam substrate specific adhesives	50
Porous material (except wood) substrate specific adhesives	50
Wood substrate specific adhesives	30
Fiberglass substrate specific adhesives	80
Sealants:	
Architectural sealant	250
Marine deck sealant	760
Nonmember roof sealant	300
Roadway sealant	250
Single-ply roof membrane sealant	450
Other sealant	420
Sealant Primers:	
Architectural non-porous sealant primer	250
Architectural porous sealant primer	775
Modified bituminous sealant primer	500

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Architectural Applications:	Allowable VOC Content (g/L):
Marine deck sealant primer	760
Other sealant primer	750
Other	
Other adhesives, adhesive bonding primers, adhesive primers or any other primers	250

1. Exception: The provisions of SCAQMD Rule 1168 do not apply to adhesives and sealants subject to state or federal consumer product VOC regulations.
- C. EQc2, Low-Emitting Materials, Flooring: Flooring shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." And meet one of the following:
1. SCS Floorscore
 2. CRI Green Label Plus
 3. AQSI – Greenguard for Children and Schools
- D. EQc2, Low-Emitting Materials, Composite Wood: Composite wood, agrifiber products, and adhesives shall be made using ultra-low-emitting formaldehyde (ULEF) resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.
- E. EQc2, Low-Emitting Materials, Ceilings, Walls, and Thermal, and Acoustic Insulation: Ceilings, walls, and thermal insulation shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
1. Thermal (batt) insulation must be formaldehyde free.
- F. EQc2, Low-Emitting Materials, Exterior Applied Materials: At least 90 percent of exterior applied materials, measured by volume, shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
1. The following materials are prohibited and do not count toward total percentage compliance:
 - a. Hot-mopped asphalt for roofing.
 - b. Coal tar sealants for parking lots and other paved surfaces.
- G. EQc2, Low-Emitting Materials, Furniture: At least 90 percent of furniture, measured by cost, shall be tested in accordance with ANSI/BIFMA Standard Method M7.1-2011; comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach; and model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate.
- H. Additional Low-Emitting Requirements:
1. If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.

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2. If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.
3. Methylene chloride and perchloroethylene may not be intentionally added in paints, coatings, adhesives, or sealants.

2.04 INDOOR WATER USE REDUCTION

- A. WEp2, Indoor Water Use Reduction, Appliances: Provide ENERGY STAR or performance equivalent appliances.
- B. WEp2/WEc2, Indoor Water Use Reduction, Plumbing Fixtures: Do not exceed water flow requirements indicated in Division 22 - PLUMBING.
- C. WEc4, Water Metering: Submit fixture cut sheets showing minimum reduction thresholds and usage based calculations.

PART 3 - EXECUTION

3.01 NONSMOKING BUILDING

- A. EQp2, Environmental Tobacco Smoke Control: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes. Signage must be visible at all site entrances throughout construction.
 1. Refer to Section 01 57 33, "Temporary Indoor Air Quality Control."

3.02 CONSTRUCTION WASTE MANAGEMENT

- A. MRp2 MRc5, Construction and Demolition Waste Management: Comply with Section 017419 "Construction Waste Management and Disposal."

3.03 CONSTRUCTION IAQ MANAGEMENT

- A. EQc3/EQc4, Construction Indoor Air Quality Management Plan: Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."
 1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 01 Section "Temporary Facilities and Controls," install MERV 8 filter media at each return-air inlet for the air-handling system used during construction.
 2. Replace air filters immediately prior to occupancy.

3.04 IAQ ASSESSMENT

- A. Flush-Out:

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1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of 14,000 cu. ft. of outdoor air per sq. ft. of floor area while maintaining an internal temperature of at least 60 deg F, but less than 80 deg F, and a relative humidity no higher than 60 percent.
 2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of 3500 cu. ft. of outdoor air per sq. ft. of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm per sq. ft. of outside air or the design minimum outside-air rate, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14,000 cu. ft./sq. ft. of outside air has been delivered to the space.
- B. Air-Quality Testing: Owner will engage testing agency to perform the following:
1. Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "LEED v4 Reference Guide for Building Design and Construction."
 2. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
 - a. Formaldehyde: 27 ppb.
 - b. Particulates (PM10): 50 micrograms/cu. m.
 - c. Ozone: 0.075 ppm, according to ASTM D 5149.
 - d. Total Volatile Organic Compounds: 500 micrograms/cu. m.
 - e. 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.
 - f. Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
 - g. Target Chemicals in California Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Table 4-1 (except formaldehyde): Allowable concentrations in California Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Table 4-1.
 - h. Particulates (PM10): 50 mcg/cu. m.
 - i. Particulates (PM2.5): 50 mcg/cu. m.
 - j. Ozone: 0.07 ppm, in accordance with ASTM D5149.
 - k. Formaldehyde: 20 mcg/cu. m.
 - l. Acetaldehyde: 140 mcg/cu. m.
 - m. Benzene: 3 mcg/cu. m.
 - n. Hexane: 7000 mcg/cu. m.
 - o. Naphthalene: 9 mcg/cu. m.
 - p. Phenol: 200 mcg/cu. m.
 - q. Styrene: 900 mcg/cu. m.
 - r. Tetrachloroethylene: 35 mcg/cu. m.
 - s. Toluene: 300 mcg/cu. m.
 - t. Vinyl Acetate: 200 mcg/cu. m.
 - u. Dichlorobenzene: 800 mcg/cu. m.
 - v. Xylenes - Total: 700 mcg/cu. m.

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3. For each sampling point where the maximum concentration limits are exceeded, take corrective action until requirements have been met.
4. Air-sample testing shall be conducted as follows:
 - a. All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at the minimum outside-air flow rate for the occupied mode throughout the duration of the air testing.
 - b. Building shall have all interior finishes installed, including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Nonfixed furnishings, such as workstations and partitions, are encouraged, but not required, to be in place for the testing.
 - c. Number of sampling locations varies depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 5000 sq. ft. For large open spaces, one sampling point per 50,000 sq. ft. may be used.
 - d. Air samples shall be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

3.05 LEED v4 PROJECT CHECKLIST

- A. Refer to the LEED v4 for BD+C: Schools Project Checklist, attached at the end of this Section.

3.06 AIR BARRIER TESTING

- A. Air- and Vapor-Barrier Membrane Air-Infiltration Testing (Quantitative Testing):
 1. Methodology: provide quantitative air-infiltration testing on the air and vapor barrier in general accordance with ASTM E783 – Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors, The Owner shall provide a written report documenting the procedures and results of the testing.
 - a. See Section 01 91 15 “Facility Shell Commissioning.”
- B. Field test installed air barrier system components in accordance with the IECC requirements and ASTM 1186 Air Leakage Site Detection in Building Envelopes and Air Barrier Systems: 4.2.6 – Smoke test and 4.2.7 – Leak Detection Liquid. The ASTM 1186 test shall be conducted at an air pressure difference of 1.57 psf. No indication of leaks.
 - a. See Section 01 91 15 “Facility Shell Commissioning.”
 - b. Field test installed air barrier system components as directed by Building Envelope Commissioning Agent, in accordance with IEC requirements and ASTM E1358 and E3158. Tests include:
 - 1) Tests of air pressure shall be conducted at a difference of 1.57 psf.:No indication of leaks.
 - 2) Smoke tests.
 - 3) Leak detection, liquid.
 - 4) Air infiltration: Whole Building Air Infiltration; Testing goal 0.15 cfm/sf @75 PA.
 - 5) Water infiltration.
 - 6) Blower door testing.

3.07 WHOLE BUILDING AIR INFILTRATION TESTING

1. Testing Agency: **Contractor shall engage** a qualified testing agency to perform tests and inspections.
2. Methodology: The Owner shall provide blower door testing on the building in accordance with ASTM E3158, Standard Test Method for Measuring the Air Leakage Rate of a Large or Multizone Building.
3. The Contractor shall be responsible for providing all labor and materials to construct temporary barriers required to conduct the whole-building air leakage testing. This may include, but is not limited to, studs, plastic sheeting, and tape. Distribute written field reports summarizing the test procedures and results, as well as recommendations for follow-up action as necessary.
4. Frequency of Tests: Blower-door test is to be performed after the construction work, with all associated insulation, flashings, and details necessary to make the building enclosure weathertight, is completed.
5. Testing agent to employ Infrared (IR) and Smoke as required to identify and source leaks.
6. Acceptance Criteria: Building enclosures shall not allow more than 0.15 cfm/sq ft at 75 Pa.

END OF SECTION 018113.14