

**EXHIBIT A  
PROJECT BUDGET  
TOWN OF UXBRIDGE**

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**PROJECT SCOPE & BUDGET AGREEMENT**

## Total Project Budget

<b>Uxbridge Uxbridge High School</b>			<b>7/19/2010</b>
<b>TOTAL PROJECT BUDGET - ALL COSTS ASSOCIATED WITH THE PROJECT ARE SUBJECT TO 963 CMR 2.16(5)</b>	<b>Estimated Budget</b>	<b>*Cost/Scope Items Excluded from the Total Facilities Grant</b>	<b>*Ineligible Costs</b>
Feasibility Study Agreement			
OPM Feasibility Study	\$133,500		
A&E Feasibility Study	\$361,160		
Env. & Site			
Other	\$260		
<b>Feasibility Study Agreement Subtotal</b>	<b>\$494,920</b>	<b>\$0</b>	<b>\$0</b>
Administration			
<b>Legal Fees</b>			
<b>Owner's Project Manager</b>			
Design Development	\$53,000		
Construction Contract Documents	\$212,000		
Bidding	\$26,420		
Construction Contract Administration	\$837,000	\$125,227	
Closeout	\$69,750		
Extra Services			
Reimbursable & Other Services			
Cost Estimates			
<b>Advertising</b>	<b>\$70,000</b>		
<b>Permitting</b>			
<b>Owner's Insurance</b>			
<b>Other Administrative Costs</b>	<b>\$5,000</b>		
<b>Administration Subtotal</b>	<b>\$1,273,170</b>	<b>\$125,227</b>	<b>\$0</b>
Architecture and Engineering			
<b>Basic Services</b>			
Design Development	\$640,000		
Construction Contract Documents	\$1,115,000		
Bidding	\$80,000		
Construction Contract Administration	\$895,000		
Closeout	\$94,200		
Other Basic Services			
<b>Reimbursable Services</b>			
Construction testing			
Printing (over minimum)	\$35,000		
Other Reimbursable Costs			
Hazardous Materials			
Geotech & Geo-Env.	\$100,000		
Site Survey	\$50,000		
Wetlands	\$70,000		
Traffic Studies			
<b>Architectural/Engineering Subtotal</b>	<b>\$3,079,200</b>	<b>\$0</b>	<b>\$0</b>
<b>CM &amp; Risk Preconstruction Services</b>			
Pre-Construction Services	\$100,000		
Site Acquisition			
Land/Building Purchase			
Appraisal Fees			
Recording fees			
<b>Site Acquisition Subtotal</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

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<b>Uxbridge Uxbridge High School</b>			<b>7/19/2010</b>
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<b>Construction Costs</b>			
<b>SUBSTRUCTURE</b>			
Foundations	\$1,243,192		
Basement Construction	\$302,721		
<b>SHELL</b>			
SuperStructure	\$2,836,451		
Exterior Closure	\$2,991,879		
Roofing	\$1,519,165		
<b>INTERIORS</b>			
Interior Construction	\$3,230,645		
Staircases	\$155,961		
Interior Finishes	\$1,556,690		
<b>SERVICES</b>			
Conveying Systems	\$81,500		
Plumbing	\$1,045,632		
HVAC	\$3,691,010		
Fire Protection	\$475,025		
Electrical	\$2,681,656		
<b>EQUIPMENT &amp; FURNISHINGS</b>			
Equipment	\$1,161,446		
Furnishings	\$613,280		
<b>SPECIAL CONSTRUCTION &amp; DEMOLITION</b>			
Special Construction			
Existing Building Demolition			
In-Bldg Hazardous Material Abatement			
Asbestos Cont'g Floor Mat'l Abatement			
Other Hazardous Material Abatement			
<b>BUILDING SITEWORK</b>			
Site Preparation	\$611,181		
Site Improvements	\$3,143,679		\$154,997
Site Civil/ Mechanical Utilities	\$941,723		
Site Electrical Utilities	\$338,200		
Other Site Construction	\$200,000		
Scope Excluded Site Cost		\$3,192,886	
<b>Construction Trades Subtotal</b>	\$28,821,036	\$3,192,886	\$154,997
Contingencies (Design and Pricing)	\$3,090,104	\$342,332	\$16,618
D/B/B Sub-Contractor Bonds	\$216,000	\$23,929	\$1,162
D/B/B Insurance	\$0	\$0	\$0
D/B/B General Conditions	\$1,400,000	\$155,096	\$7,529
D/B/B Overhead & Profit	\$0	\$0	\$0
GMP Insurance	\$464,000	\$51,403	\$2,495
GMP Fee	\$478,667	\$53,028	\$2,574
GMP Contingency	\$0	\$0	\$0
Escalation to Mid-Point of Construction	\$0	\$0	\$0

## Total Project Budget

<b>Uxbridge Uxbridge High School</b>			<b>7/19/2010</b>
<b>TOTAL PROJECT BUDGET - ALL COSTS ASSOCIATED WITH THE PROJECT ARE SUBJECT TO 963 CMR 2.16(5)</b>	<b>Estimated Budget</b>	<b>*Cost/Scope Items Excluded from the Total Facilities Grant</b>	<b>*Ineligible Costs</b>
Overall Excluded Construction Cost		\$0	
<b>Construction Budget</b>	<b>\$34,469,807</b>	<b>\$3,818,675</b>	<b>\$185,376</b>
<b>Alternates</b>			
<b>Alternates Subtotal</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<i>Const. Contingency</i>	\$1,723,490		
Miscellaneous Project Costs			
<i>Utility company Fees</i>			
<i>Testing Services</i>	\$100,000		
<i>Swing Space/Modulars</i>			
<i>Other Project Costs (Mailing &amp; Moving)</i>	\$15,000		
<b>Misc. Project Costs Subtotal</b>	<b>\$115,000</b>	<b>\$0</b>	<b>\$0</b>
<i>Furnishings and Equipment</i>			
<i>Furnishings</i>	\$720,000		
<i>Equipment</i>			
<i>Computer Equipment</i>	\$720,000		
<i>Scope Excluded FFE Costs</i>			
<b>FF&amp;E Subtotal</b>	<b>\$1,440,000</b>	<b>\$0</b>	<b>\$0</b>
<i>Owner's Contingency</i>			
<i>Owner's Contingency</i>	\$304,413		
<i>Soft Costs that exceed 20% of Const'n Cost</i>			
<b>Total Project Budget</b>	<b>\$43,000,000</b>	<b>\$3,943,901</b>	<b>\$185,376</b>
Alternates	\$0		
Ineligible cost	\$185,376		
Scope items excluded	\$3,943,901		
Estimated Basis of Total Facilities Grant	\$38,870,723		
Reimbursement Rate	56.53%		
<b>Estimated Total Maximum Facilities Grant</b>	<b>\$21,973,620</b>		

\*NOTE: This document was prepared by the MSBA based on a preliminary review of information and estimates provided by the Town of Uxbridge for the Uxbridge High School project. Based on this preliminary review, certain budget, cost and scope items have been determined to be ineligible for reimbursement, however, this document does not contain a final, exhaustive list of all budget, cost and scope items which may be ineligible for reimbursement by the MSBA. Nor is it intended to be a final determination of which budget, cost and scope items may be eligible for reimbursement by the MSBA. All project budget, cost and scope items shall be subject to review and audit by the Authority, and the Authority shall determine, in its sole discretion whether any such budget, cost and scope items are eligible for reimbursement. The MSBA may determine that certain additional budget, cost and scope items are ineligible for reimbursement.



**EXHIBIT B  
PROJECT SCOPE  
TOWN OF UXBRIDGE**

**PROJECT SCOPE & BUDGET AGREEMENT**



## **BUILDING SYSTEMS NARRATIVE**

The proposed school is comprised of two story Classroom wings, attached to a double story 'commons' that runs on an axis from the front door to the Blackstone river in the distance. The Auditorium and story and a half cafeteria, as well as the media center, administrative suite and guidance suite are all integrated with the commons. A single story Technical Education wing, is positioned at the rear, integral with the TV studio and building service spaces such as receiving and the kitchen. Physical Education spaces are segregated to the east, with a separate public entrance and a direct connection to playing fields at the lower level. Music spaces are adjacent to and around the Auditorium, but are physically separated for acoustic control.

The academic wing is oriented to maximize daylighting. The building is designed and constructed to allow for a future build-out of classrooms by extension of the two story wing, and all other core and subject-area specialty subjects.

An important design feature is the planning associated with the potential construction of a pitched roof. The 'base-bid' incorporates a flat roof design, but the exact same floor plan can be used in the case bids come in low enough to incorporate a 'pitched' roof, which would result in lower ongoing maintenance costs over the life of the building. Both versions were developed, priced and incorporated in the Schematic Design Submission.

Because it's a new site, the phasing will be straightforward and construction will not have any adverse impact on ongoing educational operations. The building will be constructed in one phase.

Total building size will be 123,000 square feet, in accordance with the space requirements set out in the Proposed Space Summary. A description of the major building systems follows.

## **OUTLINE OF MAJOR BUILDING SYSTEMS**

This section describes the major structural, mechanical, and electrical systems incorporated into the 'base-bid' version of the Schematic Design.

Please see Section #23 – Outline Specifications for Narratives for every architectural, site, and other system incorporated into the Schematic Design and included in the Cost Estimate in Section 18.

### **FOUNDATIONS:**

Based on the good soil conditions, the columns of the proposed structure would bear on reinforced concrete spread footings and the perimeter foundation walls would bear on continuous reinforced concrete footings extending a minimum of 4 feet below grade.

### **FIRST FLOOR CONSTRUCTION:**

# FERNANDEZ & ASSOCIATES

## FIRE PROTECTION ENGINEERS

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63 Larkin Road, Byfield, MA 01922 • (978) 499-0172 • (978) 465-2371 • Web: <http://www.fernandezassoc.com>

### **Guardrails**

Guardrails are required at all open sides of stairs, ramps and other areas where the floor level is 30 or more inches above the floor below or grade. (780 CMR §1012.1)

The height of the guardrails is required to be at least 42 inches in height. (780 CMR §1012.2)

Open guardrails are required to have an ornamental pattern or intermediate rails so that a four (4) inch diameter sphere cannot pass through. (780 CMR §1012.3)

### **Exit capacity and Other Dimensions**

#### **Doors**

Exit door leaves are required to be a minimum nominal width of 36 inches to a maximum of 48 inches. The minimum height of any exit door leaf is 6'-8".

The minimum clear width of exit doors is the greater of 32 inches or the calculated width based on 0.15 inches per person. (780 CMR §1008.1)

#### **Corridors**

The minimum clear width of corridors is the greater of 72 inches or the calculated width based on 0.15 inches per person. Corridors serving an occupant load of less than 100 are permitted to have a minimum clear width of not less than 44 inches or the calculated width based on 0.15 inches per person. (780 CMR §1016.2 and §10016.2 Exception #4)

#### **Stairs**

Stairs must have a minimum width of 44 inches or the calculated width based on 0.2 inches per person. (780 CMR §1009.1)

Handrails are permitted to project not more than 4-1/2" from each side of the stair. Stringers, trim and other decorative features are permitted to project not more than 1-1/2" from each side. (780 CMR §1009.11.7 and §1009.11.6)

The top of handrails and handrail extensions must not be less than 34 inches, nor more than 38 inches above landings and the nosing of treads. Handrails must be continuous the full length of the stair and at least one must extend in the direction of the stair not less than 12 inches beyond the top riser, nor less than 12 inches plus the width of one tread beyond the bottom riser. (780 CMR §1009.11.1 and §1009.11.5, 521CMR§ 27.4.3)

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The rise of steps and stairs must not be less than 4 inches nor more than 7 inches and the run must not be less than 11 inches as measured horizontally between the vertical planes of the furthestmost projection of adjacent treads or nosing. Stair treads and risers must be uniform size and shape, except the largest tread run within a flight of stairs must not exceed the smallest by more than 0.375 inch. (780 CMR §1009.3)

### **Ramps**

The minimum clear width of ramps is must be no less than the required width of corridors. (780 CMR §1010.5)

The maximum slope of a ramp is 1 in 12 for accessibility. (780 CMR §1010.2)

Handrails for ramps having slopes steeper than 1 unit vertical in 20 units horizontal shall have handrails as required for stairways. (780 CMR §1010.8)

### **Landings**

Landings at doors and stairs are required to be at least as wide as the door or stair, whichever is greater. (780 CMR §1009.4)

Landings for ramps are required for slopes greater than 1 in 20. Intermediate landings are required for each five feet of rise. Top landings and intermediate landings are required to be five feet measured in the direction of ramp run. Bottom landings are required to be six feet measured in the direction of ramp run. (780 CMR §1010.6)

## **FIRE ALARM SYSTEM**

### **General Requirements**

A fire alarm with voice evacuation system is required to be activated by the automatic fire extinguishing systems, manual pull stations and detection. (780 CMR §907.2.3)

### **Detection**

Manual pull stations are required to be provided within 5 feet of every exit in the natural path of travel. Additional manual pull stations must be located so that, from any part of the building, not more than 200 feet horizontal distance on the same floor shall be traversed in order to reach a station. (780 CMR §907.3.1)

### **Notification**

Occupant notification is required and must be by audible and visible signals meeting the ADA requirements as well as the NFPA 72 "National Fire Alarm Code" standards. (780 CMR §907.9)

Fire department notification is required. The fire alarm system is required to be monitored by a central station or a remote station. (780 CMR §907.14)

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## SUPPRESSION

### Portable Fire Extinguishers

Portable fire extinguishers are required. (780 CMR §906.2)

### Automatic Sprinkler System

The building is required to be fully sprinklered. (780 CMR §903.2.3)

The building is classified under the National Fire Protection Association (NFPA) 13 “Standard for the Installation of Sprinkler Systems”, 2007 edition as show on the table below:

Location	Hazard Classification	Design Density
Classrooms, Offices, Waiting Areas, Gym, Cafeteria	Light Hazard	0.10 gpm/sf over 1500 sf
Mechanical, Electrical, Storage Areas	Ordinary Hazard Group 2	0.20 gpm/sf over 1500 sf

Quick Response sprinkler heads are required for light hazard occupancies and should be utilized throughout the building.

Sprinklers are not required, nor permitted in elevator machine rooms, elevator pits or top of the elevator hoistways.

### Standpipe System

A standpipe system is not required for the building due to highest story/floor level is less than 30 feet above fire department access. (780 CMR §905.3.1)

Class III standpipes with 1-1/2 inch and 2-1/2 inch hose connections are required on each side of the Stage for stages larger than 1,000 square feet. (780 CMR §905.3.4) The hose connections are allowed to be supplied from the automatic sprinkler system and must have a flow rate of not less than that required by NFPA-14 for Class III standpipes when the building is equipped with automatic sprinklers. (780 CMR §905.3.4 exception)

## **EMERGENCY LIGHTING & EXIT SIGNS**

### **Exist Signs**

Exit signs are required on each floor and in rooms or areas that require two or more exits. Exit signs are required at each exit and as required to clearly indicate the egress path. No point can be more than 100 feet from the nearest exit sign. (780 CMR §1011.1)

Exit signs must have the word "EXIT" on the sign in block capital letters not less than 6 inches in height with a stroke of not less than 0.75 inch. The letters must be no less than 2 inches in width except for the "I" and have a minimum spacing between the letters of not less than 0.375 inch. The lettering, arrows and other symbols on the exit signs must be in high contrast with their background. (780 CMR §1011.5.1)

Power supplied for means of egress illumination must supply continued illumination in the event of a main power loss for a period of 1-1/2 hours and should be automatically provided from an emergency power system of batteries, unit equipment or an on-site generator. (780 CMR §1006.3)

### **Emergency Lighting**

Exits are required to be illuminated at all times when buildings are occupied. (780 CMR §1006.1)

Emergency lighting must be arranged to provide initial illumination that is at least an average of one foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. (780 CMR §1006.4)

For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the floor level is permitted to be reduced during performances to not less than 0.2 foot-candle (2.15 lux) provided that the required illumination is automatically restored upon activation of the fire alarm system. (780 CMR §1006.2 exception)

Power supplied for means of egress illumination must supply continued illumination in the event of a main power loss for a period of 1-1/2 hours and should be automatically provided from an emergency power system of batteries, unit equipment or an on-site generator. (780 CMR §1006.3)

## **ELEVATOR**

### **General Requirements**

Elevator service must be provided for fire department emergency access. All elevators are required to be with a Phase I and Phase II automatic recall and fire department control feature. (780 CMR §30.0)

All new buildings in which an elevator is being installed, for which building permits are issued on or after January 1, 2010 must be provided with at least one passenger elevator designed to accommodate the loading and transportation of an ambulance gurney or stretcher in its horizontal position. The elevator must serve all floors of the building. (524 CMR §17.4)

Elevator shafts and elevator machine room are required to be enclosed with construction having a fire resistive construction rating of not less than the shaft or hoistway it serves. Openings must be protected with assemblies having a fire resistive construction rating not less than the hoistway enclosure doors. (780 CMR §3003.2)



## **SMOKE CONTROL**

### **Stage**

Emergency ventilation is required for stages larger than 1,000 square feet in floor area, or with a stage height greater than 50 feet. The ventilation shall be provided by either roof vents or smoke control. (780 CMR §410.3.7)

Two or more roof vents constructed to open automatically by approved heat-activated devices and with an aggregate clear opening area of not less than 5 percent of the area of the stage must be located near the center and above the highest part of the stage area. Supplemental means must be provided for manual operation of the ventilator. (780 CMR §410.3.7.1)

Smoke control in accordance with 708 CMR §909 must be provided to maintain the smoke layer interface not less than 6 feet above the highest level of the assembly seating or above the top of the proscenium wall opening for a minimum of 20 minutes. (780 CMR §410.3.7.2)

### **Atria**

A smoke control system must be provided within the atrium and all areas open to the atrium. The smoke control system will automatically start upon activation of the sprinkler system within the atrium and/or other areas open to the atrium as well as smoke detection provided within the atrium.

The smoke control system must be designed as per Section 909.0 of 780 CMR. This section allows for either mechanical or natural ventilation. The system must maintain the smoke interface level at least 10 feet above the highest walking surface within the atrium for 20 minutes. (780 CMR §909.4.6) In addition the smoke control system must be provided with emergency power and have a manual override for firefighter's control of the system. (780 CMR §909.16)

**100% Schematic Design  
UNIFORMAT SPECIFICATIONS**

# **UXBRIDGE HIGH SCHOOL**

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**246-270 Quaker Highway  
Uxbridge, Massachusetts**

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**Raymond Design Associates, Inc.**

222 North Street, Hingham, Ma 02043

Tel: 781-749-5530

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**June 11, 2010**



<b>0</b>	<b>SUMMARY</b>
<b>10</b>	<b>PROJECT DESCRIPTION</b>
<b>20</b>	<b>PROCUREMENT AND CONTRACTING</b>
<b>30</b>	<b>COST SUMMARY</b>
<b>A</b>	<b>STRUCTURE</b>
<b>A10</b>	<b>SUBSTRUCTURE</b>
<b>A20</b>	<b>SUPERSTRUCTURE</b>
<b>B</b>	<b>SHELL</b>
<b>B10</b>	<b>EXTERIOR VERTICAL ENCLOSURES</b>
<b>B20</b>	<b>EXTERIOR HORIZONTAL ENCLOSURES</b>
<b>C</b>	<b>INTERIORS</b>
<b>C10</b>	<b>INTERIOR CONSTRUCTION</b>
<b>C20</b>	<b>INTERIOR FINISHES</b>
<b>D</b>	<b>SERVICES</b>
<b>D10</b>	<b>CONVEYING</b>
<b>D20</b>	<b>PLUMBING</b>
<b>D30</b>	<b>HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)</b>
<b>D40</b>	<b>FIRE PROTECTION</b>
<b>D50</b>	<b>ELECTRICAL</b>
<b>D60</b>	<b>COMMUNICATIONS</b>
<b>D70</b>	<b>ELECTRONIC SAFETY AND SECURITY</b>
<b>D80</b>	<b>INTEGRATED AUTOMATION</b>
<b>E</b>	<b>EQUIPMENT AND FURNISHINGS</b>
<b>E10</b>	<b>EQUIPMENT</b>
<b>E20</b>	<b>FURNISHINGS</b>
<b>F</b>	<b>SPECIAL CONSTRUCTION AND DECONSTRUCTION</b>
<b>F10</b>	<b>SPECIAL CONSTRUCTION</b>
<b>F20</b>	<b>SPECIAL CONSTRUCTION</b>
<b>F30</b>	<b>FACULTY REMEDIATION</b>
<b>F40</b>	<b>DEMOLITION</b>

**UXBRIDGE HIGH SCHOOL**

Quaker Highway  
Uxbridge, Massachusetts

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- G SITEWORK**
- G10 SITE PREPARATION**
- G20 SITE IMPROVEMENTS**
- G30 SITE LIQUID AND GAS SITE UTILITIES**
- G40 ELECTRICAL SITE IMPROVEMENTS**
- G50 SITE COMMUNICATIONS**
- G90 OTHER SITE CONSTRUCTION**

**APPENDICES**

**APPENDIX A: MA-CHPS SCORECARD**

**APPENDIX B: AUDITORIUM AUDIO-VISUAL SYSTEMS, SCHEMATIC DESIGN REPORT**

**APPENDIX C: FOOD SERVICE SPECIFICATIONS AND LISTS OF EQUIPMENT**

**APPENDIX D: GEOTECHNICAL REPORT**

**0 SUMMARY**

**10 PROJECT DESCRIPTION**

**1010 PROJECT SUMMARY**

1010.01 Work covered by Contract Documents: The Project consists of construction of new 123,000 square foot high school at 246-270 Quaker Highway, Uxbridge, Massachusetts. Work includes related site work, underground utilities, parking and on-site service and fire-access roadways, playgrounds, and multi-purpose playing fields.

- Completeness: The Work shall be as shown on the Drawings and be complete in every respect and in conformance with all applicable requirements of the governing laws and codes. Nectar

1010.02 Contract Term: The successful Bidder may begin on-site work on, or after date, with receipt of a written Notice to Proceed, or suitable Letter of Intent. After commencement of work, the Contractor shall pursue the Work continuously and with diligence, and bring the Project to Substantial Completion within 480 calendar days from date of Notice to Proceed.

- Substantial completion is the stage in the progress of the Work when the work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. This includes any and all permits required by governmental agencies necessary for occupancy and use.

1010.03 Building Permits: Contractor is responsible to ensure all required permits are obtained, and that the work pertaining to permits is properly inspected and certified. Filed Subcontractors are required to obtain permits relating to their work.

- The Town of Uxbridge may waive the cost of Building and Trade Permits, however all permits must be obtained, inspected, and certified for completion.

**1030 PROJECT PROGRAM**

**1030.01 Program**

Program spaces are typical for a high school, which include academic (classrooms, laboratories, and vocational rooms), and non-academic spaces. Program includes standard and special subject classrooms, gymnasium, auditorium with stage, cafeteria with complete full service kitchen and servery, a library-media center with associated support spaces, administration suite and administration support spaces.

The new building is proposed to consist of two structurally separated wings. Expansion joints will be required to separate the two sections.

- The new building will be designed to resist wind and earthquake forces by utilizing braced steel frames (in each direction).
- Reinforced masonry shear walls may also be utilized around stair locations. These masonry shear walls in general will be 8" wide.

The classroom wing will consist of a first floor level, a second floor level, and a roof level. The gymnasium wing building will consist of a basement level, a first floor level, a second floor and low roof level, and a high roof level. Design provisions will be implemented for future vertical

**UXBRIDGE HIGH SCHOOL**

Quaker Road  
Uxbridge, Massachusetts

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and horizontal expansion. The rear "Tech ED" wing will have a flat roof structure sized to support future expansion.

**1030.02 Design Standards**

- The structural design of the foundations and superstructure will be in accordance with the 7th Edition of the Massachusetts State Building Code and any future revisions and amendments to such.

**1030.03 Design Loads (per Commonwealth of Massachusetts Building Code, 7<sup>th</sup> Edition)****Dead loads:**

Slab/deck system	48 psf
Structural Steel	Actual Weight
Ceiling	5 psf
Services and Partitions	10 psf
Roofing	10 psf
Miscellaneous	2 psf

**Live loads:**

Classrooms	50 psf
Corridors	80 psf
Lobbies/stairs	100 psf
Open Plan Areas	100 psf
Library/Mechanical Areas	150 psf

**Roof/Snow Loads:**

Ground Snow Load	55 psf
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**Wind Load:**

Basic Wind Speed	100 mph
Exposure	C
Importance Factor, $I_w$	1.15

**Earthquake Loads (Pending Final Geotechnical report):**

Seismic Use Group	II
Site Class	D
Seismic Design Category	B
Seismic Importance Factor, $I_s$	1.15
Spectral Response Coefficients	

$S_{DS} = .31$

$S_{D1} = .1136$

Analysis Procedure: Equivalent Lateral Force Procedure

**1030.04 Environmental Requirements**

The Owner has established the environmental goal to construct a "green" environmental friendly, building integrating the Owner's environmental operational mission and the GREEN SCHOOLS INITIATIVE program into this Project. These goals are outlined in the *Massachusetts High Performance Green Schools Guidelines: Criteria, 2009 edition* (referred to herein as "CHPS" or MA-CHPS). The Contractor shall refer to individual specification sections for more detailed requirements. In general highlights of the CHPS program include the following goals:

- Comply with sustainable site criteria.
- Comply with energy efficiency criteria.

- Comply with water-use reduction criteria.
- Comply with Low-Emitting Materials (low-VOC's) criteria and indoor air quality criteria.
- Comply with acoustics criteria.
- Comply with construction and debris waste diversion threshold of 90 percent.
- Comply with building commissioning criteria.

Contractor's participation: The Contractor shall provide all administrative and procedural requirements necessary for the Owner to achieve its environmental goals in the construction of this Project.

- The Contractor shall incorporate into the construction specific "green" products, which comply with the Owner's environmental goals and objectives. Additionally the Contractor is required to utilize "green" products, which are part of the building process but not included in the final construction, (for example, cleaners, shipping containers and similar supplementary items).
- The Contractor is advised that special consideration and modification of the Contractor's means and methods may be additionally required to achieve the Owner's environmental goals which are beyond the requirements of the Contract Documents.
- The Contractor shall designate a trained and qualified representative responsible for instructing workers and overseeing the Owner's environmental goals for this Project.
- The Contractor shall provide a waste and recycling program for handling and disposal of solid waste, with a minimum 75% diversion rate.

1030.05 Environmental Objectives:

Major components of the Owner's environmental goals include construction utilizing "green products", pollution prevention during the construction process, and maintenance of healthy Indoor Air Quality (IAQ). Green products and materials require the incorporation into the Project: utilization of recycled materials and materials with high-recycled content, use of designated sustainable managed products, and energy efficient equipment and fixtures.

Pollution prevention as achieved through recycle and reuse of materials, waste handling procedures, and limiting harmful pollutants emitted into the air, soil, and waterways. Pollution prevention efforts include, but are not limited to:

- Providing additional temporary facilities and controls.
- Minimizing the release of carbon dioxide (CO<sub>2</sub>) from fuels burned on site or fuels burned off site to supply electricity to the building.
- Avoiding the release of ozone-depleting compounds, such as HCFCs from refrigerants or foam insulation materials
- Enhancement, restoration, and protection of the natural environment of the site.
- Water resource protection: Conserve and use water efficiently, limit on-site fresh water usage to the greatest extent possible, control water distribution systems and waste, minimize use of imported or mined water. Capture and utilize rainwater to the greatest extent permitted by Law. Utilize water-conserving appliances and equipment.
- Air Quality is achieved by compliance with the limitation of indoor air concentrations of certain pollutants, at or below the established maximum allowable concentrations. Healthy air quality goals shall be maintained during construction, and through building commissioning.
- Use construction practices that achieve the most efficient use of resources and materials.

1050 EXISTING CONDITIONS (NA)

1060 OWNER'S WORK



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Designated portions of the work will be performed by the Owner. This work in generality includes, but is not limited to:

- Testing Laboratory Services
- Telephone/Data and communications systems.
- Water and gas meters.
- Furnishings and equipment, artwork, loose casegoods and similar items.
- Building Commissioning Agent.

### 1070 PROJECT CRITERIA

#### 1070.01 Regulatory Requirements

All work shall be performed in accordance with all applicable codes including the following:

- Massachusetts State Building Code, Seventh edition, as amended.
- Town of Uxbridge Zoning Bylaws, as amended.
- Massachusetts Fuel, Gas, and Plumbing Code.
- Massachusetts Electrical Code (1999 National Electrical Code, with Massachusetts amendments from 527 CMR 12.00).
- Massachusetts Fire Prevention Regulations (527 CMR).
- Commonwealth of Massachusetts Elevator Code.
- Commonwealth of Massachusetts Regulation 521 CMR: *Architectural Access Board*, effective 1/27/06, as amended.
- United States Occupational Safety and Health Administration (OSHA): Standard N°. 29-CFR-1926.59 - *Hazard Communication Standard*.
- United States Department of Justice, N° 28 CFR Part 36 - *Americans with Disabilities Act*, (Public Law 101-336).

1070.02 Important Tax Note: The Town of Uxbridge is exempt from certain taxes. It is therefore required that the Contractor and all Subcontractors purchasing taxable goods or services make known to suppliers that tax-exempt status of the Owner, in order that such taxes will not be applied to the goods under Contract. In the event that such taxes are paid on any items, the Contractor shall obtain rebates for the taxes and reimburse the Owner in the full amount by change order.

1070.03 Prevailing Wages: The Commissioner of Labor and Industries has established prevailing minimum wage rates that must be paid to all workers employed on the Contract. The Schedule shall continue to be the minimum rate of wages payable to workers on the Contract throughout the term of the Contract.

## 20 PROCUREMENT AND CONTRACTING

### 2030 QUALIFICATION REQUIREMENTS

The General Contractor and Filed-Subcontractor selection process for the Project is a two-phase process as set forth in the General Laws of the Commonwealth of Massachusetts (MGL) Chapter 149 §44D ½, and in MGL chapter 149 §44D ¾. Under this process the Awarding Authority's Project Manager will pre-qualify Contractors and Filed-subcontractors who will be eligible to bid. The project delivery method for construction will be under MGL chapter 149.

GENERAL CONTRACT BIDDERS must be certified by the Commonwealth of Massachusetts, Division of Capital Asset Management in category of "General Building Construction".

FILED-SUBBIDDERS must be certified by the Commonwealth of Massachusetts, Division of Capital Asset Management in appropriate category of trade(s) for each Filed-sub-bid being submitted.

**2050      PROCUREMENT REQUIREMENTS**

Copies of the Bidding and Contract Documents may be obtained as subsequently specified under the Invitation to Bid.

**2070      CONTRACTING REQUIREMENTS**

**2070.01**      Bidding procedures and award of Contract and Subcontracts are subject to the provisions of the General Laws of the Commonwealth of Massachusetts (MGL) Chapter 149, Sections 44A to 44J inclusive; applicable sections of MGL Chapter 30; MGL Chapter 674 of the Acts of 1981, and "Construction Reform" amendments contained in MGL Chapter 193 of the Acts of 2004

**2070.02**      Filed-Sub-Bids: Under the provisions of Massachusetts General Law, Chapter 149, Filed Sub-Bids are required for the following listed trades.

- MASONRY
- MISCELLANEOUS AND ORNAMENTAL IRON
- WATERPROOFING DAMPPROOFING AND CAULKING
- ROOFING AND FLASHING
- METAL WINDOWS
- GLASS AND GLAZING
- PLASTER
- TILE
- ACOUSTICAL TILE
- RESILIENT FLOORING
- PAINTING
- ELEVATORS
- PLUMBING
- HEATING, VENTILATION AND AIR CONDITIONING
- ELECTRICAL

**30            COST SUMMARY**

**3010        ELEMENTAL COST ESTIMATE**

**3010.01**      The Project includes all new building construction, including associated site work. The estimated construction cost is approximately 34.4 million dollars.

***UNIFORMAT II LEVEL 2***

**PROJECT:    UXBRIDGE HIGH SCHOOL**

**SIZE (gsf):   123,000**

**LOCATION:    Uxbridge, Massachusetts**

**ESTIMATOR:   PM&C**

**PLAN DATE:   May 21, 2010**

DIVISION	SUMMARY
A. SUBSTRUCTURE	\$ 000
B. SHELL	\$ 000
C. INTERIORS	\$ 000
D. SERVICES	\$ 000
E. EQUIPMENT and FURNISHINGS	\$ 000
F. SPECIAL CONSTRUCTION and DEMOLITION	\$ 000
G. BUILDING SITEWORK	\$ 000

GENERAL CONTRACTORS BOND COST	\$ 000
SUBCONTRACTORS BOND COST ON 9 MILLION	\$ 000
GENERAL CONDITIONS 7 1/2%	\$ 000
BUILDING PERMIT	BY OWNER
LIABILITY INSURANCE	\$ 000
FEE 4 1/2 %	\$ 000
ESTIMATING CONTINGENCY 7 1/2%	\$ 000
ESCALATION 3 1/2 %	\$ 000
 SUB-TOTAL:	 \$ 000
 COST PER GSF	 \$ 000

3070 ALTERNATES

3070.01 Alternate Number 1: Sloped Roof.

3070.02 Alternate Number 2: Playing Fields.

**A STRUCTURE**

**A10 SUBSTRUCTURE**

**A1010 FOUNDATIONS**

**A1010.01 Description:**

All unsuitable fill and organic materials shall be removed and replaced with well compacted structural fill. All fill placed under the new building shall be compacted to 95% of the Standard Proctor Density with a fill moisture content maintained to within 3% of optimum

All new foundations will be supported on conventional spread footings, continuous strip footings, or combined footings bearing on top of undisturbed native soils or imported structural fill. The foundation design is based upon the Preliminary Geotechnical Report, dated October 8, 2009, and prepared by Peer Consultants, PC, Burlington, MA. All new footings with a safe bearing pressure of 3200 psf shall be founded a minimum of 4 feet 0 inches below final exterior grades to provide adequate frost protection. The allowable bearing capacity is pending a complete geotechnical report.

Typical interior column spread footings will be approximately 7 feet 0 inches by 7 feet 0 inches by 24 inch deep reinforced with 7 - #6's bottom each way. (Pending Final Geotechnical Report)

Exterior foundations at the locker room will be cast-in-place concrete retaining walls designed to allow backfilling during construction and supporting floor slab and masonry walls.

**A1030 SUBGRADE ENCLOSURE**

**A1030.01** All deep excavations shall be protected by a temporary shoring system or with soil excavated on a 2 (horizontal) to 1 (vertical) slope.

**A1030.02** Subgrade Enclosure Wall Waterproofing: Adhered vertical waterproofing: Self-adhesive sheet membrane vertical waterproofing applied to exterior surfaces of below-grade concrete walls with prefabricated composite drainage board protection.

Waterproofing membrane: Prefabricated composite sheet, minimum of 60 mils thick, consisting of 56 mils thickness of rubberized asphalt and 4 mils thick cross-laminated polyethylene film, self-adhering after removal of release paper, and furnished in 36 or 48 inch wide rolls, formulated for anticipated ambient temperature. Acceptable waterproofing products, or approved equal:

Composite drainage board: Prefabricated geocomposite drainage mat consisting of a formed polystyrene or PVC hollow-studded core with one side bonded with a woven or non-woven polypropylene filter fabric, which is compatible to waterproofing manufacturer. Drainage composite shall be designed to promote positive drainage while serving as a protection course. Acceptable drainage board products, or approved equal:

- Carlisle, product "Sure Drain Drainage Composites", Type V for vertical applications, and Type H for horizontal applications.
- Grace, product "Hydroduct", No. 220 for vertical applications, No. 660 for horizontal applications.

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- Henry, product "DB", No. 500 for vertical applications and No. 650 for horizontal applications.

### **A1050 SLABS-ON-GRADE**

A1050.01 Basement Slabs: 5 inch deep concrete slab (on grade), reinforced with synthetic fibermesh or welded wire fabric, will be used at the slab-on-grade locations. Typically, all new slabs-on-grade will be placed over vapor barrier and a 6 inch layer of stone structural fill over well-compacted and prepared subgrade. (Pending Final Geotechnical Report)

A1050.02 First floor slab-on-grade of the classroom wings and the main building will also be constructed of a 5 inch deep concrete slab-on-grade reinforced with synthetic fibermesh over a vapor barrier over a 6 inch layer of stone structural fill over well-compacted and prepared subgrade. (Pending Final Geotechnical Report)

A1050.03 Underslab Vapor Barrier: Vapor Barrier must have the following qualities

- Minimum WVTR as ASTM E96 of 0.008
- Water Vapor Barrier tested by ASTM E-1745: Meets or exceeds Class A

Acceptable manufacturers and products:

- Stego Wrap (15 mil) Vapor Barrier by Stego Industries LLC, San Juan Capistrano, CA
- W.R. Meadows Premoulded Membrane with Plasmatic Core.
- Reef Industries Houston, TX, Product Griffolyn Vaporguard.

### **A1070 WATER AND GAS MITIGATION**

A1070.01 Underslab drains: Underslab and foundation drainage system (below the slab-on-grade) may be necessary at the basement level.

A1070.02 Elevator pit waterproofing: cementitious waterproofing at walls and floor of elevator pits. Acceptable manufacturers and products include the following:

- Five Star Products, Inc., Fairfield CT, product Five Star Cementitious Waterproofing.
- Silpro Masonry Systems, Inc., Ayer MA, product Sealcoat
- Thoro System Products, Miami FL, product "Thoroseal"

A1070.03 First floor at locker room/gymnasium will have 10 inch precast concrete hollow core units with 2 inch structural topping supported on load bearing reinforced CMU walls.

## **A20 SUPERSTRUCTURE**

### **A2010 FLOOR CONSTRUCTION**

A2010.01 Floor construction at the second floor will be structurally framed (typically) with composite steel construction. Conforming to a construction classification of Type 1-B the structural framing system would consist of 3 and ¼ inch deep lightweight concrete on 2 inch deep by 20 gage galvanized composite steel decking spanning to structural steel beams and girders. In general, the supporting steel members at the second floor in the classroom wings would typically be W18 beams spaced at 8 feet 4 inches on center spanning 36 feet 0 inches (maximum) to structural steel girders, with an average of 1 inch upward camber. Structural steel girders, spanning 33 feet 0 inches (maximum) would typically be W21 with an average of 1 inch upward camber. Headed shear studs (¾ inch in diameter by 3 and ½ inches long) would be attached

(field welded) to the top flange of the steel beams and girders to achieve composite-action behavior. The overall slab/deck system would be 5 and 1/4 inches.

In general, the typical interior columns will be 8 inch by 8 inch or 6 inch by 6 inch square tube structural steel sections supporting the second floor and roof levels. The typical exterior columns will be 6 inch by 6 inch square tube structural steel sections.

A2010.02 The overall slab/deck system would be 5 and 1/4 inches, with shear studs attached to the top flange of the steel beams and girders to achieve composite-action behavior.

A2010.03 The single story technical/educational area will be designed to support a future 2<sup>nd</sup> floor addition, where the roof construction will be similar to 2<sup>nd</sup> floor academic wing with 5 and 1/4 inch lightweight concrete on steel beams and girders with composite construction.

**A2020 LATERAL LOADING**

A2020.01 Both wind and seismic loads will be resisted by ordinary braced frames at the academic wing. The main common areas, gymnasium and auditorium will have reinforced masonry shear walls.

**A2030 ROOF CONSTRUCTION**

A2030.01 Classroom Wing Roof Construction: the typical roof construction in the classroom wings will be structured with 3 inch deep by 20 gage galvanized steel roof decking spanning 8 feet 10 inches (maximum) to W16 structural steel beams, which span 36 feet (maximum) to W21 structural steel girders.

**Base Bid – Flat Roof:**

- The beams and girders will slope to low points at column/roof drain locations.
- Flat roof at the gymnasium and auditorium will have deep long span joists 60 inches at 8 to 10 feet on center with 3 inch galvanized cellular acoustic deck. The exterior walls will be reinforced concrete masonry with HSS 12x12 columns and W24 girders.

**Alternate Number 1 – Sloped Roof:**

- Sloped beams will cantilever over girders and columns at corridor beam and girder sizes, similar to flat roof with corridor columns increasing to heavier HSS 8x8.
- Sloped roofs at the gymnasium and auditorium will have steel trusses with 12 inch WT's top and bottom chord and double angle diagonals. Spacing will be 25 feet with W14 purlins at 8 to 10 feet on center supporting 3 inch acoustic cellular steel deck.

**A2080 STAIRS**

A2080.01 Exterior Stairs: Cast-in-place concrete slabs reinforced with reinforcing bars supported on reinforced concrete foundation walls and footings. Tread and landing surface will receive a broom finish.

A2080.02 Interior Stairs: Steel pan stairs with concrete fill, having intermediate landing construction, complete with all supporting members and customized railings.

Performance Requirements: conform to all requirements of those codes and regulations referenced. Sizes of all headers, stringers, and other structural members; and gauges and configurations of all riser tread and landing plates and pans, handrails, stringers, and posts shall be as indicated on the approved shop drawings, and in accordance with the standards of the National Association of Architectural Metal Manufacturers.

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- Design, fabricate and install stairs to safely support a minimum live load of 100 pounds per square foot and a concentrated load of 300 pounds at center of each tread as required under the Massachusetts State Building Code, Seventh Edition.
- Design, fabricate and install all railings in a manner which will ensure the railings will be capable of withstanding loads required under the Massachusetts State Building Code, Seventh Edition.

### **A2090 SPECIAL RAILING SYSTEMS**

#### **A2090.01 Glass panel and metal railing system at pedestrian bridges and monumental stairs at "Commons"**

Railing system: Custom fabricated shop-painted railing system.

Glass Panels: 3/4-inch thick fully tempered clear safety glass panels.

## **B SHELL**

### **B10 EXTERIOR VERTICAL ENCLOSURES**

#### **B1010 EXTERIOR ENCLOSURE WALLS**

##### **B1010.01 Exterior Wall Construction:** There are two types of exterior cavity wall construction, in general enclosure walls are steel framed, with cold formed metal framing and masonry veneer. In limited areas, the masonry veneer will be backed by masonry.

##### **B1010.02 Cavity Wall Construction:**

Metal Stud Framing with Sheathing: Cold formed engineered stud framing, 18 gauge or heavier steel studs with G90 galvanizing, spaced not more than 16 inches on center. covered with 1/2 inch thick glass-fiber-faced gypsum panel sheathing.

- Curtainwall stud framing will be designed to resist wind loads calculated for the Project by the Massachusetts Building Code, Seventh Edition, with deflection not to exceed 1/720 where framing carries masonry veneer; and not to exceed 1/360 where framing carries metal panels.

Masonry Back-up wall Construction: In limited areas, (stair towers gymnasium and where indicated on Drawings), cavity wall construction with masonry back-up is required. In these locations, wall construction behind the brick facing will be nominal 8 inch thick concrete unit masonry (CMU) reinforced with galvanized steel rebar and horizontal truss reinforcing to meet Code requirements for structural and seismic performance. Masonry lintels will be used in back-up wythe above doors, window, and louver openings

##### **B1010.03 Air and Vapor Barrier Systems:**

Underslab vapor barrier is described under A1050.

Wall air and vapor barrier systems at masonry veneer: Fluid (liquid), spray applied air and vapor barrier system, with membrane transition and edging at all openings in exterior walls, in conjunction with windows, doors, penetrations, louvers, sheet metal flashing, roofing edges, fascia, eaves and similar penetrating and transition conditions of building envelope.

Acceptable manufacturers, or approved equal:

- Henry Company, Huntington Park CA., "Airbloc 21S".
- Carlisle Coatings & Waterproofing Inc., Sapulpa, OK., "CGW-525".
- W.R. Grace & Co., Construction Products Division, Cambridge MA., "Procor".

Wall air and vapor barrier systems at wall panels: Self-adhesive elastomeric sheet membrane air and vapor barrier system, including specified sheet membrane, required primers and adhesives with membrane transition and edging at all openings in exterior walls, in conjunction with windows, doors, penetrations, louvers, sheet metal flashing, roofing edges, fascia, eaves and similar penetrating and transition conditions of building envelope.

Acceptable manufacturers, or approved equal:

- Henry Company, Huntington Park CA., Blueskin SA.
- Carlisle Coatings & Waterproofing Inc., Sapulpa, OK., Perm-a-Barrier.
- W.R. Grace & Co., Construction Products Division, Cambridge MA., CGW-705.

- B1010.04 Wall Insulation: 2 inch thick of size to suit spacing of through-wall reinforcement. Closed cell rigid extruded polystyrene foam board insulation, square edge, self-extinguishing, conforming to ASTM C 578, Type IV, with a compressive strength of 25 pounds per square inch when tested in accordance with ASTM D 1621 equal to Dow Chemical Corp., Styrofoam Brand "Cavity Mate Plus" insulation.

Acceptable manufacturers, or approved equal:

- Amoco Foam Products Company, Atlanta, GA.
- Dow Chemical Corp., Midland MI.
- UC Industries (Division of Owens-Corning), Parsippany, NJ.

- B1010.05 Masonry veneer wall finish: Brick masonry veneer construction for exterior walls backed by either structural light gage metal framing or concrete unit masonry as appropriate to location.

Facing Brick: ASTM C 216, Type FBS, Grade SW, modular size 3-5/8 inch width by 2-5/16 inch high, by 7-5/8 inch length, in texture and color to match approved samples.

Architectural Precast Concrete: Precast concrete sills fabricated in accordance with PCI MNL-116, PCI MNL-120, PCI Manual For Structural Design of Architectural Precast Concrete, with light abrasive-blast finish in color and texture to simulate limestone.

- B1010.06 Composite panel wall finish: Preformed composite pressure equalized rout and return metal composite faced panel system including required supports, trim and sealant shall meet all regulatory requirements for wind loading, water penetration, and air leakage. System shall comply with applicable provisions of the "Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual" published by AAMA, and ANSI/AAMA 302.9 requirements for aluminum windows and the following:
- Air Leakage: Not more than 0.004 cfm/sf (0.02 (L/s)/sq m) of wall area when tested at a specified 1.57 psf (0.075 kPa) in accordance with ASTM E 283.
  - Water Penetration: No water infiltration under static pressure when tested in accordance with ASTM E 331 at differential of 10 percent of inward acting design load, 6.24 psf (0.299 kPa) minimum, after 15 minutes.
  - System must meet the local Massachusetts Building Code and the new Energy Code 780 CMR Chapter 13.



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Acceptable Wall Panel Systems, or approved equal: Lymo Architectural Panel Systems., product "Lymo 2000": Pressure Equalized Rainscreen System with 3/4 inch (19 mm) wide reveal joints using proprietary aluminum extrusions; and joint filler strip of same material as panels that allows variation in joint width.

Acceptable manufacturers, or approved equal:

- Dummon Corporation, St. Louis MO.
- Lymo Architectural Panel Systems Inc.,
- Sobotec Ltd., Hamilton Ontario, Canada.

**B1030 EXTERIOR WINDOWS**

- B1030.01 Aluminum Windows: Aluminum-framed windows in "punched" openings (masonry surrounding the window). These will be windows of traditional single-hung design, or projecting operable (vent) panes. Window frame extrusions will incorporate a non-metallic thermal break to reduce heat loss, and the insulating glass units will include a low-emissivity coating. Insect screens will be provided.

Performance values: Conform to ANSI/AAMA 101-97 requirements for minimum performance classification H-AW45, for air leakage, water drainage, water penetration, uniform structural loading.

Glazing: Insulating glass, nominal 1 inch thick consisting of (1/4 inch clear glass + 1/2 inch air space and 1/4 inch clear glass), with high-performance low-E (low-emissivity) coating on the second surface. Glass performance U-value = 0.31 or less, (solar heat gain coefficient (SHGC) 0.39 or better.

Interior window stools: Red Oak plywood with solid Red Oak edging and apron.

Acceptable manufacturers, or approved equal:

- Graham Architectural Products, York PA.
- EFCO Corp., Monett, MO.
- Wausau Metals Corporation, Wausau, WI.

- B1030.02 Aluminum Curtain Wall: Extruded aluminum curtain wall system. Mullions 2-1/2 inch face width, by depth required to resist wind loads, Framing will incorporate a non-metallic structural strut between interior and exterior metal framing. U-value of 0.42 or lower when glazed.

Glazing: Insulating glass, nominal 1 inch thick consisting of (1/4 inch clear glass + 1/2 inch air space and 1/4 inch clear glass), with high-performance low-E (low-emissivity) coating on the second surface. Glass performance U-value = 0.31 or less, (solar heat gain coefficient (SHGC) 0.39 or better.

Acceptable manufacturers, or approved equal:

- EFCO Corp., Monett, MO.
- Kawneer Manufacturing Company, Norcross GA.
- Wausau Metals Corporation, Wausau, WI.

- B1030.03 Projecting Greenhouse window units: Aluminum-framed factory pre-fabricated greenhouse windows.

Acceptable manufacturers, or approved equal:

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B1050 EXTERIOR DOORS AND GRILLES

- B1050.01 Aluminum Storefront Systems: Exterior and interior storefront framing system: Integrated flush-glazed, exterior glazed, stick fabricated system with thermal break and insulated glass. Vertical and horizontal framing members shall be of shear block construction and have a nominal dimension of 2 inch face width by 4-1/2 inch total depth.

Acceptable manufacturers, or approved equal:

- EFCO Corp., Monett, MO.
- Kawneer Manufacturing Company, Norcross GA.
- Wausau Metals Corporation, Wausau, WI.

Glazing: Insulating safety glass, nominal 1 inch thick consisting of (1/4 inch fully tempered clear glass + 1/2 inch air space and 1/4 inch fully tempered clear glass), with high-performance low-E (low-emissivity) coating on the second surface. Glass performance U-value = 0.31 or less, (solar heat gain coefficient (SHGC) 0.39 or better.

- B1050.02 Hollow Metal Doors and Frames: Exterior and interior storefront framing system: Integrated flush-glazed, exterior glazed, stick fabricated system with thermal break and insulated glass. Vertical and horizontal framing members shall be of shear block construction and have a nominal dimension of 2 inch face width by 4-1/2 inch total depth.

Exterior Frames: 14 gage, 0.067 inch thick, with a zinc coating supplied by the hot-dip process conforming to ASTM A653, Grade 37, with coating applied in accordance with A 924.

Exterior Doors: ANSI 250.8, Level 3, Model 2 (Seamless), ANSI A250.4 Physical Performance Level B, (Extra Heavy Duty) having 16-gage, 0.058 inch thick (1.46 mm) galvanized steel faces, with a minimum R factor of 14

- B1050.03 Exterior Overhead Coiling Doors:

General: Electrically operated insulated overhead doors with interlocking flat-faced insulated slats, 22 gage steel sandwich construction, nominal 3 inches high and double steel angle for bottom slat. Curtain door shall have Continuous, vertical mounted galvanized guides formed from 3/16 inch thick angles.

- Provide lift handles on bottom bar and pole with hook.
- Locks: Pin tumble single unit mechanism, installed on each jamb, and designed to accommodate cylinders provided by Section 08 71 00 - DOOR HARDWARE.

Door Operation: 3/4 HP Motor, 115/230 VAC single phase, totally enclosed, instant reversing, with electric interlock to prevent operation when lock bolts are engaged in guides. Control circuit: 24 VAC, Class 2 with two 3-button keyed control stations.

Acceptable manufacturers, or approved equal:

- Cornell Iron Works, Inc., Mountaintop PA.
- Wayne-Dalton Corp., Mt. Hope OH.
- Raynor, Dixon IL.

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**B1070 EXTERIOR LOUVERS AND VENTS****B1070.01 Architectural Louvers**

Mechanical Room Louvers: Extruded aluminum fixed blade louvers with drainable blade profile; high performance painted finish, with bird screen, and with insulated blank-out panels to cover excess louver area not connected to duct.

**B1080 EXTERIOR WALL APPURTENANCES****B1080.01 Outrigger Sun Shades:** Factory pre-fabricated aluminum louvered fixed sunshades, steel-reinforced consisting of outriggers, louvers, and fascia permanently anchored directly to the vertical members of curtain wall system framing. Located on south-facing elevations. Configuration, straight extension with squared ends and square fascia, having air-foil shaped blades.

Acceptable manufacturers, or approved equal:

- EFCO Corp., Monett, MO.
- Kawneer Manufacturing Company, Norcross GA.
- Wausau Metals Corporation, Wausau, WI.

**B20 EXTERIOR HORIZONTAL ENCLOSURES****B2010 ROOFING****B2010.01 Low-Slope (Flat) roofing system:**

Fully adhered heat weldable TPO membrane roofing system, including insulation and substrate, shall meet Underwriters Laboratories, Inc. Fire Hazard Classification "Class A" roof.

- Performance Requirements: Design roofing system for basic wind speed of 110 miles per hour.
- Color: As selected by Architect having a Solar Reflectance Index (SRI) of 78 or greater

**Basic Roofing Components**

- Roofing membrane: Thermoplastic Polyolefin based membrane having a nominal thickness of 45 mils.
- Overlayment (recovery) Board: Non structural glass mat faced, noncombustable, water-resistant treated gypsum core panel, Dens-Deck by Georgia-Pacific 1/2 inch thick complying with ASTM C 1177 and FM 4450, Class I.
- Polyisocyanurate foam insulation manufactured with HCFC 14 pound blowing agent and bonded to glass fiber reinforced facers on top and bottom surfaces. Thickness to provide R-value required by Commonwealth of Massachusetts State Building Code.
- Thermal barrier: UL fire resistance rated, ASTM C79 'Type X' board, 5/8 inch thick, of largest sizes to minimize joints.
- Vapor Barrier:

Acceptable manufacturers, or approved equal:

- Carlisle Syntec Systems, Carlisle PA.
- Firestone Building Products Co., Carmel IN.
- Versico Inc., Akron OH.

Warranty: Total system warranty, 20 years with enhanced wind uplift warranty.

- B2010.02** Sloped roofing system: Asphalt shingle roofing applied over underlayment and nailable composite insulated panels.

Asphalt shingles: UL Class 'A' and wind resistant label Self-sealing, laminated, mineral granule surfaced, glass fiber mat base shingle roofing, in color as selected by Architect, conforming to ASTM specifications: D 3018 Type I and D 3462, having a minimum weight of 400 pounds per roofing square and furnished with a limited lifetime manufacturers product warranty. Color: As selected by Architect having a Solar Reflectance Index (SRI) of 29 or greater

Acceptable manufacturers, or approved equal:

- Certainteed, product "Grand Manor Shingle".
- GAF - Elk, product "Camalot".
- IKO, product "Cambridge LT".

Vented Nailable Composite Insulation: Provide polyisocyanurate foam core insulation panels with a vent space and nailable wood fiber composite board surface that is acceptable to the roofing manufacturer for its warranties.

- Provide panels consisting of an polyisocyanurate foam core bonded to oriented strand board (OSB) top layer and a fiber reinforced facer sheet on the bottom layer complying with ASTM C1289, Class 2 type II panel.

Acceptable manufacturers, or approved equal:

- Atlas Roofing Corporation, Meridan MS, product "ACFoam Vented-R".
- Cornell Corporation, Cornell WI, product "Vent-Top ThermaCal 1".
- Rmax, Inc., Dallas TX, product "Vented Nailable Base".

Membrane for ice-dam and wind-blown rain protection: Sheet barrier of rubberized membrane bonded to sheet polyethylene, minimum 40 mil (1.13 mm), one total thickness, with strippable treated release paper; having the following minimal characteristics:

Acceptable manufacturers, or approved equal:

- W.R. Grace Company, Cambridge MA., product "Vycor Ice & Water Shield".
- Nicolon/Mirafi Group, Norcross GA., product "Miridri WIP".
- Polyken Technologies, Division of Kendall Company, Mansfield MA., product "Polyken 640 Underlayment Membrane, Ice-O-Late".

## **B2020 ROOFING APPURTENANCES**

- B2020.01** Prefabricated roof scuttles, with insulated hatch cover and prefabricated insulated curb.

Description: Factory prefabricated roof scuttle/hatch unit having a clear opening dimension of 36 inches wide by 36 inches.

Acceptable manufacturers, or approved equal:

- Babcock-Davis Hatchways, Inc., Arlington MA.
- The Bilco Company, New Haven CT.
- Dur-Red Products, Cudahy Ca.
- Nystrom Inc., Minneapolis MN.
- Precision Ladders, LLC, Morristown TN.
- Wasco Products, Inc.

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**B2020.02 Smoke Vents above stage, with insulated hatch cover and prefabricated insulated curb.**

Description: UL-labeled low profile, automatic heat and smoke relief venting units, factory-assembled for installation on roof deck. Vents shall open automatically when pressure within the building exceeds 30 pounds per square foot uplift pressure.

Acceptable manufacturers, or approved equal:

- Babcock-Davis Hatchways, Inc., Arlington MA.
- The Bilco Company, New Haven CT.
- Naturalite/EPI Inc., Garland TX.

**B2060 HORIZONTAL OPENINGS****B2060.01 Translucent Skylight Systems**

Factory engineered, insulated translucent panel skylight system consisting of 2-3/4 inch thick pre-fabricated sandwich panels, framing and installation system, and prefinished aluminum flashing.

- Design and size skylight panel system to withstand a minimum 40 pounds per square foot vertical live loading caused by snow and hail. Design system for 22-1/2 pounds per square foot uplift loading from pressure/suction of wind.

- Installed assemblies: Conform to ANSI/AAMA 101:

Air infiltration shall not exceed 0.0 cfm per square foot of window unit surface area at 1.57 psf.

Water resistance: test in accordance with ASTM E331 and ASTM E547 at a static air pressure difference of 8.25 psf with result of no water leakage.

Acceptable manufacturers, or approved equal:

- Kalwall Corporation: Manchester NH.
- GSI, Grayslake, IL.
- Major Industries, Wausau WI.

**B2080 OVERHEAD EXTERIOR ENCLOSURES****B2080.01 Exterior Soffits: Direct applied finish system applied over 1/2 inch thick aggregated portland cement sheathing with treated mesh reinforcement mounted to cold-formed metal framing structure. Finish equal to Sto Industries, "Sto Quik Flex" system.**

Acceptable manufacturers, or approved equal:

- Sto-ex Inc., Kentwood, MI.
- Parex, Inc., Redan, GA.
- Dryvit Systems, Inc., West Warwick, RI.

**C INTERIORS****C10 INTERIOR CONSTRUCTION****C1010 INTERIOR PARTITIONS****C1010.01 Metal Framed Veneer Plaster Partitions**

Non-structural steel framing members to receive veneer plaster base extending from floor slab to overhead structure having acoustical insulation full height of partition:

- Furring channels: 7/8 x 2-3/4 inch, roll-formed, hat-shaped, furring channel 25 gage hot-dip galvanized steel conforming to ASTM C 645.
- Studs: 'C-shaped' screw studs, hot-dip galvanized steel complying to ASTM C 645, 20 gage (0.0329 inch [0.84 mm] minimum thickness), of widths indicated on the Drawings, or other gages as required under the specified standards to meet fire resistance ratings.
- Runners for metal studs: 'U-shaped' hemmed, hot-dip galvanized steel track conforming to ASTM C645, of gage and width to match respective stud sizes, or heavier gage per design requirements, having 1-1/4 inch leg, provided at tops and bottoms of all studs and at heads of all openings in stud partitions.
- Internal reinforcement for various stud conditions, and bracing as required: 10 gage, minimum, galvanized steel.
- Acoustical insulation: Mineral wool fiber insulation batts, conforming to ASTM C665 Type 1, and ASTM C553 with a nominal density of 2.5 pounds per cubic foot, nominally 3-1/2 inches thick.

Ceiling and soffit suspension system: Grid system for direct attachment of plaster base and veneer plaster finish: Comprised of double web main furring tees, 1 1/2 inches high by 1-3/8 inches flange face by 0.020 inch thick; double web cross tees, 1 1/2 inches high by 15/16 inch flange face by 0.020 inch thick; 0.020 inch thick wall channels, with 1 1/2 inches interior web height; and all splices, clips, and related items. Provide Underwriters Laboratories Label fire-rated assemblies for locations requiring fire-rated ceilings and soffits

Plywood backing behind veneer plaster base at Corridors and public (common) areas: 1/2 inch thick APA graded C-D PLUGGED INT, Group 2 species.

Veneer Plaster System: Two-coat veneer plaster complete with 5/8 inch thick Type "X" gypsum plaster base panels complying with ASTM C 588 and UL classified 'Type IP-X1' for use in UL fire resistance rated assemblies, metal screeds, grounds and expansion/control joints, trim accessories, and all related items. Provide acoustical joint sealant and backing at perimeter of veneer plaster partitions.

- Plaster for Two coat system: High-strength gypsum plaster applied in two troweled-on coats to total thickness of 3/32 inch to 1/8 inch (2.4 mm), over plaster base complying with ASTM C 587.

#### C1010.02 Masonry partitions.

Concrete unit masonry partitions: 2 hour rated concrete masonry partitions, single wythe with all reinforcement, anchorage, and accessories.

- Concrete Masonry Units: ASTM C90, Type 1, Class 1, normal weight, 2-core, 58 percent solid.

#### C1020 INTERIOR WINDOWS

##### C1020.01 Hollow Metal Frames:

General: Hollow metal frames for doors and for fixed-glazed window conditions, UL-Labeled and non-labeled, complete with internal reinforcing.

Interior Frames: 16-gage, 0.053 inch thick, except as otherwise required for specific U.L. Label.

#### C1030 INTERIOR DOORS AND GRILLES

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C1030.01 Interior Hollow Metal Doors 1-3/4 inch thick: ANSI 250.8, Level 2, Model 1 (Full Flush), ANSI A250.4 Physical Performance Level B, (Heavy Duty) having 18-gage, minimum 0.042 inch steel faces, with a minimum STC rating of 32.

- Construction: Full flush commercial type, 1-3/4 inches thick, unless noted otherwise, meeting or exceeding the materials, gages, construction, and testing requirements of the referenced ANSI and SDI publications.

Interior Temperature-Rise-Rated Door: ANSI 250.8, Level 3, Model 1 (Full Flush), ANSI A250.4 Physical Performance Level B, (Extra-Heavy Duty) having 16-gage steel faces, Temperature-rise-rated type door, UL Class A.

C1030.02 Flush Wood Doors:

General: Flush solid core wood doors, complete with necessary blocking, hardware cut-outs; and provided with openings for glazing, where so indicated. Conform to the requirements set forth in the designated Sections of the (WDMA) Industry Standard IS 1-A-97, and the applicable requirements of U.S. Commercial Standard CS 171, as amended.

- Ratings: As scheduled.
- Face Veneer: Red Oak, Quarter Sawn.

C1030.03 Overhead Coiling Doors (at Servery):

General: Electrically operated stainless steel coiling doors having 22 gage stainless steel interlocking flat slats, nominal 3 inches high and double stainless steel angle for bottom slat. Curtain door shall have Continuous, vertical mounted galvanized guides formed from 3/16 inch thick angles.

- Provide lift handles on bottom bar and pole with hook.
- Locks: Pin tumble single unit mechanism, installed on each jamb, and designed to accommodate cylinders provided by Section 08 71 00 - DOOR HARDWARE.

Door Operation: 1/2 HP Motor, 115/230 VAC single phase, totally enclosed, instant reversing, with electric interlock to prevent operation when lock bolts are engaged in guides. Control circuit: 24 VAC, Class 2 with two 3-button keyed control stations.

Acceptable manufacturers, or approved equal:

- Cornell Iron Works, Inc., Mountaintop PA.
- Wayne-Dalton Corp., Mt. Hope OH.
- Raynor, Dixon IL.

C1090 INTERIOR SPECIALTIES

C1090.01 Visual Display Surfaces:

Classroom Markerboards: 3 framed Markerboards per classroom, 4 feet high by 8 foot width having porcelain faced 24 gage cold rolled enameling steel over 7/16 inch thick fiberboard and backed with 22 gage steel sheet. Frame, extruded 6063-T5 alloy aluminum with clear anodized finish.

Athletic Team Room Markerboards: One framed Markerboard per athletic team room, 4 feet high by 8 foot width having porcelain faced 24 gage cold rolled enameling steel over 7/16 inch thick fiberboard and backed with 22 gage steel sheet. Frame, extruded 6063-T5 alloy aluminum with clear anodized finish.

Tackboards: 2 framed tackboards per classroom, 4 feet high by 8 foot width having Self-healing, mildew resistant vinyl embossed fabric covered 1/4 inch thick natural cork laminated to 1/4 inch thick fiberboard. Frame, extruded 6063-T5 alloy aluminum with clear anodized finish.

Sliding Markerboards: 2 horizontal framed sliding markerboards per science lab, music room and art room. Each nominal 4 feet high by 8 foot width having porcelain faced 24 gage cold rolled enameling steel over 7/16 inch thick fiberboard and backed with 22 gage steel sheet. Frame, extruded 6063-T5 alloy aluminum with clear anodized finish.

- Music staff lining at Music Education Room(s): 1/8 inch lines, 1-1/2 inch on centers with 5 inches between staves.

Acceptable manufacturers (all markerboards), or approved equal:

- American Chalkboard, Inc., Wetumpka, AL.
- Claridge Products & Equipment Inc., Harrison AR
- Charles Mayer Studios, Inc., Akron OH.

#### C1090.02 Signage:

Informational and directional signage: Photopolymer plaque signage (general requirements): Identification signs with raised tactile graphics, text, and Grade 2 Braille. Signs shall consist of 1/32 inch thick synthetic light sensitive photo emulsion permanently bonded to a rigid phenolic substrate, aluminum or acrylic plaque.

- At each alarmed exit door: Provide sign, 9 inches high by 18 inches wide, having 3 inch high raised letters identifying "EMERGENCY EXIT ONLY" followed by 1 inch high raised letters identifying "ALARM WILL SOUND". Provide with Grade 2 Braille strip.
- Room numbers: For each door frame off corridors, and stairwells, identify room numbers, with 1 inch high die cut lettering. Mount lettering horizontally, centered on door frame at head of door.
- At each door to the all service rooms mechanical rooms, equipment rooms, janitor's closets and similar room types, provide: nominal 6 by 8 inch size sign, having 1-1/2 inch high letters identifying room label, a maximum of 2 lines of copy, and Grade 2 Braille strip.
- At toilet room doors: provide: nominal 6 by 8 inch size sign, having 3 inch high international symbol for men/women (as appropriate) beneath provide 5/8 inch high text "MEN" or "WOMEN" (as appropriate), raised 1/32 inch and a Grade 2 Braille strip.  
At each wheelchair accessible toilet room, provide international handicap symbol.

Acceptable manufacturers, or approved equal:

- Apco New England, Franklin, MA.
- Back Bay Sign Company, Somerville, MA.
- Design Communications, Boston, MA.
- General Sign Company, Norwood, MA.
- Sunshine Sign, North Grafton, MA.

Exterior signage: Cast stainless steel letters: Projecting 12 inches high, individual cast stainless steel letters, 7/8 inch thick, equal to with an average stroke width of 1-1/2 to 3/4 inches. Letters shall have a satin face and edges.

Acceptable manufacturers, or approved equal:

- A.R.K. Ramos, Oklahoma City OK.
- Gemini Inc., Cannon Falls MN
- Matthews International Corporation, Pittsburgh PA



- Metal Arts, Mandan ND.

**C1090.03 Toilet Compartments:**

Phenolic toilet compartments, floor mounted, overhead braced, of standard height and depth, except for sizes of handicapped compartments, which shall be as indicated on the Drawings.

- Pilasters and doors: 3/4 inch [19 mm] thick, solid phenolic (black) core with integrally bonded decorative "matte finish" melamine surface on both sides.
- Panels; 1/2 inch [13 mm] thick, of same material and finish as pilasters and doors.
- Head rails: Hollow extruded aluminum tube with anti-grip top having wall thickness of not less than 0.125 inches; with cast aluminum or stainless socket brackets. Provide corner brackets, wall brackets and end caps as required.
- Hardware and fittings: Type 302/304 stainless steel

Acceptable products, or approved equal:

- Accurate Partition Corp., Lyons IL., series "Black-core Phenolic".
- Bobrick Washroom Equipment, Inc., Clifton Park NY., series "1182.67".
- Metpar Corporation, Westbury, NY., series "Overhead Braced".
- General Partitions Manufacturing Corp., Deer Park NY., series "40".

**C1090.04 Safety Specialties:**

Fire extinguisher cabinets: Fully recessed, trim-less cabinet with 5/8 inch thick door with concealed hinge.

- Door and trim: Vertical duo design with double-strength glazing. Door Type 304 Stainless steel with a Number 4 (satin) polished finish.  
Vigilante alarm: Provide 9 volt, battery operated (battery included), plunger activated vigilante alarm.

Acceptable products, or approved equal:

- JL Industries "Embassy Series", model number 5634.
- Larsen "Occult Series", model number SS-O-2409.
- Potter-Roemer, "Dana Series", model number 7260.

Fire extinguishers: Multi-purpose dry chemical type (mono ammonium phosphate), 10 pound capacity, multi-purpose rated '4A, 60B:C'; with metal valves and siphon tubes, replaceable molded valve stem seals, pressure gauges and hose discharge.

**C1090.05 Lockers: Metal lockers with all required closures, tops and filler pieces.**

Locker Type 1: Student Lockers in Corridors: 325 double tier wardrobe lockers, 16 inches wide by 16 inches deep by 72 inches high at front with an individual compartment height of 36 inches.

- Body: Backs, sides, tops, bottoms, shelves and sides minimum 24-gage. Flange tops, bottoms and shelves on four sides, and backs on two sides.
- Form exposed ends of non-recessed lockers of minimum 16-gage steel.
- Door frame: 16 gage channel or 12 gage angles, with continuous door stop/strike integral with frame on both sides of opening.
- Door: Flush design without louvers or perforations, 16 gage steel, formed with full channel shape on lock bar side, channel formation on hinge side and flanged top and bottom. Fabricate to swing 180 degrees. Latch /lock: operable by "club fist" as required by

Massachusetts AARB, with built-in combination locks having three-number combination dialing and be capable of at least five different combination changes.

- Base: Concrete Unit Masonry with wood nailers.

Locker Type 2: Sports Team Lockers: 120 single tier athletic lockers (60 men's, 60 women's) 18 inches wide by 18 inches deep by 72 inches high.

- Body: Uprights 16 gage cold rolled steel sheet having diamond shaped perforations nominally 3/4 inch by 1-1/2 inch. Fabricate backs 16 gage steel sheet formed with uprights, perforated at back to back lockers.
- Tops, bottoms, shelves and compartment dividers: 16 gage steel fully flanged on all sides. Shelves shall have an additional channel shape return flange on the front edge
- Door frame and cross members: 16 gage channel or 12 gage angles, with continuous door stop/strike integral with frame on both sides of opening.
- Door: 14 gage perforated steel, formed with full channel shape on lock bar side, channel formation on hinge side and flanged top and bottom.
- Padlock strike plate: 20 gauge stainless steel.
- Base: Concrete Unit Masonry with wood nailers.

Locker Type 3: Staff Lockers (at Food Service): 10 single tier wardrobe lockers, 12 inches wide, by 15 inches deep by 72 inches high. Same construction as Type 1 locker. Latch /lock: operable by "club fist" as required by Massachusetts AARB, with door handle latch design capable of receiving user furnished padlocks.

Locker and Team Room Benches: Fixed-in-place benches (permanent), factory fabricated having varnished laminated maple seat and chromed steel pedestals.

Acceptable manufacturers (all locker types and benches), or approved equal:

- Debourgh Manufacturing Company, La Junta CO.
- Lyon Metal Products, Inc., Aurora IL.
- Penco Products, Inc., Oaks PA.
- Republic Storage Systems Company, Inc., Canton OH.

#### C1090.06 Toilet Accessories:

Toilet, bath and custodial accessories,

- Coat/robe hook: Surface mounted satin finish stainless steel double robe hook, fabricated from 22 gage type 304 stainless steel, protrudes from wall nominally 1-7/8 inches.
- Grab bars: Stainless steel, minimum wall thickness 18 gage (Stub's gage), with non-slip knurled, peened or striated surface, 1-1/4 inch diameter with satin finished ends, concealed 1/8 inch thick mounting flange with snap-on cover.
- Grab bars at accessible showers: "L" shape grab bar with 24 and 36 inch length legs. Stainless steel, minimum wall thickness 18 gage (Stub's gage), with non-slip knurled, peened or striated surface. 1-1/4 inch diameter with satin finished ends, concealed 1/8 inch thick mounting flange with snap-on cover. (Provide configuration as indicated on Drawings).
- Mirrors, framed: one piece 3/4 by 3/4 inch type 304 18 gage stainless steel roll formed frame, with continuous integral stiffener on all sides 18 inches wide by 30 inches high. Provided with 1/4 inch thick safety glass, ASTM C 1048 FT, fully tempered, complying with Class 1 clear, quality q3 glazing select, conforming to ANSI Z97.1, with Class 1, standard commercial quality, electro-copper back-plating protected by a corrosion-resistant zinc-coating.

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- Mop and broom holders: Surface mounted, nominal 44 inch long stainless steel unit with 18 gage 8 inch deep continuous shelf, 5 stainless hooks and 4 mop/broom holders, anti-slip spring loaded, rubber cam mop holders, capable of holding 7/8 to 1-1/4 inch diameter handles.
- Sanitary napkin disposal: Surface mounted feminine napkin disposal unit, fabricated of 304 stainless steel, with one piece cover.
- Sanitary napkin disposal: Partition mounted feminine napkin disposal unit serving two toilet compartments.
- Shower curtain rods: 1-1/4 inch diameter, Stainless steel, minimum wall thickness 18 gage (Stub's gage), with stainless steel 2-1/2 inch flange and concealed fasteners. Lengths as required for locations shown on the Drawings.
- Shower Curtains: 100 percent polyester mildew resistant, Teflon coated for water repellency and stain resistance. Fabricate curtain with hemmed edges and a fully weighted, anti-fungus, mildew resistant bottom hem and corrosion-resistant grommets along reinforced top edge every 6 inches (152 mm) on center through top hem.
- Shower seat: Folding seat having a frame constructed of type-304, satin finish stainless steel, 16-gauge (1.6 mm), 1-1/4" (32-mm) square tubing, and 18-gauge (1.2-mm), 1" (102-mm) diameter tubing. Seat 18 inches wide and project nominally 16 inches from wall and have a 2 inch thick foam padded, white vinyl seat with enclosed 1/2 inch thick plywood base. Seat supports shall not come into contact with floor. Seat shall fold against wall when not in use.
- Toilet tissue dispensers at 'gang' toilets: Surface-mounted, jumbo-roll, toilet tissue dispenser, constructed of type-304 stainless steel. Dispensing mechanism accommodate two 10" (254-mm) diameter toilet tissue rolls; and be equipped with a sliding access panel that exposes one roll at a time. Spindles shall be convertible in the field to dispense 3" or 2-1/4" (76 or 57 mm) diameter core rolls with use of removable core adapters furnished.
- Toilet tissue dispensers at 'single stall' toilets: Surface-mounted double roll type toilet tissue dispenser fabricated from stainless steel, with satin finish, molded and extruded ABS spindles, vandelproof keyed locking mechanism, able to accommodate two 2000 sheet rolls.

Acceptable manufacturers, or approved equal:

- A&J Washroom Accessories, Inc., (A&J) New Windsor NY.
- American Specialties, Inc. (ASI), Yonkers NY.
- Bobrick Washroom Equipment, Inc. (Bobrick), Clifton Park NY.
- Bradley Corporation / Washroom Accessories Division, (Bradley) Menomonee Falls, WI.
- VonDrehle Corporation, Hickory NC.

### C1090.07 Window Shades:

Chain driven, manually operated roller-screens for solar shading, privacy shading and A/V blackout. chain driven, manually operated roller-screen system with vinyl-coated glass fiber fabric for interior shading, including all supplementary items required for shade installation.

Provide shades at all exterior windows, except as otherwise specified herein below, refer to plans, interior and exterior elevations for sizes. Field verify all openings.

Do not provide shades at the following locations:

- All corridors, stairs and vestibules.

Clutch and chain mechanism shade, institutional quality mounted on one-piece roller with end support brackets and bead chain clutch operator.

The first floor construction would be a 4 inch thick concrete slab-on-grade reinforced with welded wire fabric over a vapor barrier on 2 inch thick rigid insulation on 8 inches of compacted granular structural fill and a base course of 8 inches of compacted gravel.

**TYPICAL SUPPORTED FLOOR CONSTRUCTION:**

Typical supported floor construction in the Classroom Wing would consist of a 5 and ¼ inch light weight concrete composite metal deck slab reinforced with welded wire fabric on wide flange steel beams spanning between steel girders and columns. The weight of the structural steel is estimated at 12 psf.

**ROOF CONSTRUCTION:**

*Two Story Classroom Wing and Single Story Structure*

Roof construction would consist of galvanized corrugated 1 and ½ inch deep, Type 'B' metal roof deck on wide flange beams. The weight of the structural steel is estimated to be 10 psf.

*Gymnasium and Auditorium Roof*

The Gymnasium and Auditorium roof would consist of acoustic galvanized corrugated 3 inch deep, Type 'NA' metal roof deck spanning between long span metal joists spanning between wide flange steel beams and columns. The weight of the steel joists and steel framing is estimated to be 10 psf.

**LATERAL LOAD RESISTING SYSTEM:**

*Two Story Classroom Wing and Single Story Structure*

1. The lateral load resisting system would be ordinary concentric braced frames of structural steel.

*Gymnasium and Auditorium Structure*

1. The lateral load resisting system would be reinforced masonry shear walls.

**PLUMBING SYSTEMS:**

*Water Supply System*

1. The new water supply system will connect to the Uxbridge City Water system. The service will be equipped with water meter and duplex pressure reducing stations and backflow preventers as required.

*Cold and Hot Water Systems:*

1. Hot and cold water will be supplied to the toilet rooms and other fixtures in the building.



2. Potable hot water shall be generated utilizing a direct gas fired, high efficiency storage water heater sized to meet the system demand. Water shall be heated and stored at 140°F and then reduced to 120 via a thermostatic mixing valve for distribution to the fixtures. The kitchen will be supplied with hot water at 140°F.
3. Hot water shall be recirculated to maintain uniform temperature throughout the piping system.
4. All potable water systems shall require chlorination and testing prior to being put into service.
5. Cold, hot, and hot water return piping shall be Type "L" copper with lead free joints. All piping shall be insulated with 1" thick fiberglass insulation. Isolation valves shall be ball valves with 316 stainless steel balls and stems.

*Sanitary, Waste and Vent Drainage System:*

1. A gravity system of sanitary waste and vent piping shall be provided to serve all fixtures, equipment and drains requiring same. Sanitary waste shall flow via gravity piping from the fixtures, drains, and equipment to below slab sanitary piping which will intern flow to the Uxbridge city sewer.
2. Public toilet rooms shall be provided with floor drains. All floor drains in such spaces shall be equipped with trap primers or similar devices.
3. The kitchen shall have a dedicated kitchen waste drainage system which shall receive the waste from all sinks, drains and equipment in the kitchen and discharge to an exterior grease trap prior to connecting to the exterior sewage disposal system. Pot sinks, dishwashers and similar grease producing/receiving equipment shall have individual grease traps prior to discharging to the kitchen waste system. This system shall not receive human waste.

*Laboratory Waste System:*

1. Science room sinks, drains, and equipment within the Science rooms will flow via a dedicated lab waste and vent piping system to a lab waste treatment system prior to connection to the building sanitary waste system. The treatment system shall include: Tanks for continuous/batch treatment, mixers, caustic and acid solution tanks with injection pumps, control panel to activate the system components and a pH effluent sensor with strip recorder.

*Roof/Storm Drainage:*

1. A system of roof drains and interior piping shall be provided for building storm drainage. It is intended that the roof drainage will discharge to the on site storm water drainage and control system.

*Drainage Systems Piping:*



1. Sanitary waste and vent piping, kitchen waste and vent piping, and roof drainage piping shall be cast iron no-hub soil pipe and fittings above grade.
2. Type "L" copper with DWV fittings above grade for piping 2" and smaller.
3. Cast iron hub and spigot pipe and fittings buried/below grade.
4. Roof drainage piping shall be insulated the same as water piping where necessary to insure condensation does not form and damage building finishes or create mildew/mold concerns.
5. Lab waste and vent piping shall be flame retardant polypropylene pipe and fittings or CPVC pipe and fittings.

*Natural Gas:*

1. Natural gas shall be piped from the utility company meter fit to boilers, water heaters, science labs, and gas fired cooking equipment in the building requiring natural gas.
2. Natural gas piping shall be Schedule 40 steel pipe with welded and/or threaded joints and fittings depending upon size.

*Fixtures:*

1. Water Closet: Wall hung vitreous china, siphon jet action, elongated bowl, exposed chrome plated battery operated sensor flush valve of the dual flush design, open front seat less cover (solid plastic), stainless steel check hinge, carrier to suit installation.
2. Water Closet, Accessible: Same as standard water closet above, except mounted at handicapped height.
3. Urinal: Wall hung, vitreous china, siphon jet action, exposed chrome plated battery operated sensor flush valve, 1/8 gallon per flush, carrier to suit installation.
4. Urinal, Accessible: Same as standard urinal except mounted at accessible height.
5. Counter Lavatory, Counter Mounted: Undermount stainless steel bowl for installation with solid surface counter. Battery operated sensor faucet with integral temperature selection control. Flat grid drain. Chrome plated supplies and P-trap.
6. Wall Hung Lavatory: Vitreous china, wall hung lavatory with faucet ledge for 8" centers, overflow, 20" x 18" size. Battery operated sensor faucet with integral temperature selection control and flat grid drain assembly. Chair carrier to suit installation. Chrome plated sweat supplies and P-trap and escutcheons. Mounted at Accessible height.
7. Mop Receptor: 36" x 24" x 10" deep white molded stone mop receptor with 3" integral stainless steel drain. Faucet to be provided with vacuum breaker, loose key stops and hose end.
8. Accessible Electric Water Cooler: Bi-level, lead free; all stainless steel basin and panel, ADA pushbutton or bar controls, rated for 8 GPH of 50° water.



9. Counter Mounted Sinks: Self-rimming, 18 gauge, Type 304 stainless steel sinks, size as required by location. Gooseneck faucet with blade handles and flat grid drain. Chrome plated supplies and P-trap.
10. Public toilet rooms equipped with floor drains shall have hose bibs for house keeping purposes.

#### FIRE PROTECTION SYSTEMS:

1. The complex will be equipped with a new wet pipe sprinkler system throughout all areas of the building. Provide a system of piping and heads to provide fully automatic coverage throughout all areas.
2. Sprinkler system piping shall be hydraulically sized according to the following criteria: Light hazard occupancy 200 sf/head, 0.10 GPM/sf over the hydraulically most remote 1500 sf, including a 250 gpm hose stream allowance.
3. Piping shall be schedule 40 steel pipe for 1 ½" and smaller and schedule 10 for sizes 2" and larger. Piping shall be seismically braced as required by code.
4. Building to be zoned for sprinkler coverage. Zoning as a minimum will be by floor and floor areas.
5. Each zone control to consist of a supervised isolation valve, check valve, flow switch, and test and drain assembly.
6. Sprinkler heads to be semi-recessed style in areas with suspended ceilings.
7. Sprinkler heads in mechanical space and other areas without hung ceilings shall be upright or pendent as required by location.
8. The fire service will connect to the Uxbridge city water system. Should the available water supply not provide for satisfactory operation of the sprinkler system, a fire pump shall be provided to supplement the pressure and volume demands.

#### HVAC SYSTEMS:

##### *Classrooms:*

1. Classrooms, teaching and support spaces shall be served by central station variable air volume heating and ventilating air handling units with 50% outside air. Units shall have double wall casing. Each unit shall consist of mixing box section, MERV 8 (30%) pre-filter section, centrifugal supply fan section, hot water pre-heat coil, centrifugal return fan section, MERV 13 (80%) secondary filters and future cooling coil section.
2. Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.
3. Units will be mounted on 14" high vibration curbs.
4. Acceptable manufacturers shall be Trane, Carrier, York, McQuay or approved equivalent.



5. Provide medium pressure/low velocity distribution to local zone terminal boxes with reheat coils. Supply ductwork downstream of terminal units will be low pressure. All supply air ductwork shall be insulated. All return air ductwork shall be low pressure.
6. Each classroom shall be provided with individual terminal control via space thermostat. Corridor spaces shall have their own terminal control via thermostat at a constant air volume.
7. Unit shall be provided with variable frequency drives for both the supply and return fans.
8. Provide an add alternate price to provide heat recovery system to all classroom units which will utilize building exhaust air to pre-condition outdoor supply air.

*Auditorium:*

1. The Auditorium shall be served by a new dedicated single-zone heating and ventilating air handling unit to serve the multipurpose/stage area. Unit shall be located on the roof.
2. The unit shall consist of centrifugal supply fan, outdoor air/return air mixing box, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan, economizer relief, future cooling coil section and 12" vibration isolation curb. Unit shall be provided with variable frequency drives for supply and return fans.
3. Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.
4. Low pressure supply and return air ductwork shall distribute air to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.
5. Provide an add alternate add a DX cooling coil section and make the unit a packaged type with an integral condensing unit.

*Cafeteria/Kitchen:*

1. The Cafeteria & Kitchen shall be served by a new dedicated single-zone heating and ventilating air handling unit to serve the area. Unit shall be located on the roof.
2. The unit shall consist of centrifugal supply fan, outdoor air/return air mixing box, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan, economizer relief, future cooling coil section and 12" vibration isolation curb. Unit shall be provided with variable frequency drives for supply and return fans.
3. Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.
4. Low pressure supply and return air ductwork shall distribute air to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.
5. Provide a UL rated up-blast kitchen hood exhaust fan/gas-fired make-up air unit dedicated to serve the kitchen hood.
6. Kitchen hood exhaust shall be welded black iron steel.





*Gymnasium:*

1. The Gymnasium shall be served by a new dedicated single-zone heating and ventilating air handling unit to serve the gymnasium. Unit shall be located on the roof.
2. The unit shall consist of centrifugal supply fan, outdoor air/return air mixing box, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan, economizer relief, future cooling coil section and 12" vibration isolation curb. Unit shall be provided with variable frequency drives for supply and return fans.
3. Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.
4. Low pressure supply and return air ductwork shall distribute air to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.

*Locker Rooms:*

1. The Locker Rooms shall be served by a new dedicated 100% outdoor air heating and ventilating air handling unit. Unit shall be located on the roof.
2. The unit shall consist of centrifugal supply fan, enthalpy wheel exhaust heat recovery section, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan and 12" vibration isolation curb.
3. A dedicated exhaust fan shall be provided mounted on the roof.
4. Supply and exhaust fans shall be provided with VFD's.
5. Low pressure supply and exhaust air ductwork shall distribute air to ceiling supply air diffusers and exhaust air registers. All supply air ductwork shall be insulated.

*Administration Area:*

1. The Administration (and Guidance) area will be served by a new 10 ton central station air handling unit. Units shall have double wall casing. Unit shall consist of centrifugal supply fan, chilled water cooling coil, hot water coil section, outdoor air intake section, MERV 8 (30%) pre-filter section, MERV 13 (80%) secondary filters, power economizer relief and 12" high vibration isolation curb.
2. Provide medium pressure/low velocity distribution to local zone terminal boxes with hot water reheat coils. Supply ductwork downstream of terminal units will be low pressure. All supply air ductwork shall be insulated. All return air ductwork shall be low pressure.

*Media Center:*

1. The Library will be served by a central station air handling unit. Units shall have double wall casing. Unit shall consist of centrifugal supply fan, chilled water cooling coil, gas-fired furnace section, outdoor air intake section, MERV 8 (30%) pre-filter section, MERV 13 (80%) secondary filters and power economizer relief.
2. Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.



3. Provide low pressure supply and return air ductwork to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.

*Sheetmetal:*

1. All medium pressure ductwork shall be 4" pressure class.
2. All low pressure ductwork shall be 2" pressure class.
3. All interior and exterior ductwork shall be sealed per SMACNA Class "A".
4. In general ductwork shall be galvanized unless otherwise specified.
5. Kitchen hood exhaust ductwork shall be welded black iron steel.
6. Shower exhaust shall be aluminum.
7. All ductwork shall be pressure tested.

*Exhaust Systems:*

1. Toilet exhaust: Provide centrifugal roof exhaust fans mounted on 12" high sound attenuated curbs. All fans shall be provided with TEFC motor, motorized backdraft damper, disconnect switch and weather-proof motor enclosure.
2. Provide an exhaust fan for each fume hood in the Science classrooms. Each exhaust fan shall be a roof mounted centrifugal utility fan with a 10' high stainless steel discharge stack.

*IDF Closets:*

1. IDF Closets: Provide a dedicated A/C unit. Each IDF Closet shall receive a wall mounted A/C unit with a remote condensing unit located on the roof.

*Boiler Plant:*

2. The school shall be served by a central hot water boiler plant. The boiler plant shall consist of:
  - a. Gas-fired high efficiency boilers. Each boiler shall serve 1/2 of the total heating hot water required.
  - b. Provide two new hot water pumps. Pumps shall be end-suction base-mounted type. Pumps shall operate in a lead/lag configuration where one is primary and one is stand-by. Pumps shall be on variable frequency drives.
  - c. Hot water supply and return piping shall run through-out the structure to all heating elements requiring hot water. Piping shall be schedule 40 steel pipe or type "L" copper, 95/5 soldered joints rated for 150 psi.
3. Provide fintube radiation at all exterior walls in areas that do not have terminal units.
4. All exterior stair wells shall be heated with recessed or semi-recessed type hot water cabinet unit heaters at each floor level. Provide with integral thermostat for control.



5. Vestibules shall be heated with cabinet hot water unit heaters.
6. Mechanical spaces shall be heated with horizontal hot water unit heaters.

*Chiller Plant:*

1. Provide packaged air cooled liquid chiller.
2. Provide two (2) end suction centrifugal chilled water pumps (1 stand-by).
3. Piping shall be schedule 40 steel with fiberglass insulation.
4. Chilled water system shall be 25% propylene glycol.

*Automatic Temperature Controls:*

1. Provide a complete new Direct Digital Control system for the entire school. Controls shall be a programmable based computer indicating status, temperature setpoints and fault alarms.

**ELECTRICAL SYSTEMS:**

*Lighting System:*

1. The lighting package should include 277V, fluorescent luminaries with dimming electronic ballasts and super T-8 or T-5 HO lamps. An architectural lighting control system should be installed, which utilizes a digital control protocol. Each room would operate autonomously and have an entrance station for lighting controls. Dual technology occupancy detectors and room photocells will automatically reduce the mechanical light level and harvest the natural light while maintaining preset work surface light levels.
2. All lighting throughout the building will be on the lighting control systems, digital bus and programmed on and off cycles are controlled through the system timers. Mechanical and electrical spaces will not follow the building protocol; all lighting in these spaces will have local control with no automated functions. The lighting control system, for off hour building entrance can be over ridden through a local entrance station and the walking path illuminated as occupancy sensors are enabled.
3. Adequate site lighting will be designed for exterior building perimeters which includes walkways and parking areas. The latest in energy efficient LED sight lighting would be designed for the required surface foot candle levels and automatically controlled through the architectural lighting control system. Local photocells will provide the control system inputs for on and off functions. The LED fixtures will also be dimmed to provide minimal light levels for off hour operation.

*Electrical Distribution:*

1. New 277/480 volt, 3 phase, 4 wire electrical service will be designed for building power. A primary and secondary ductbank, sub-station transformer, and main distribution switchgear system would be installed. Considering the current lighting codes, indoor air quality requirements, plumbing systems requirements and increased power requirements for modern school programs, the designed service size will be approximately 2400 amps. An arch fault and electrical coordination study will be conducted before the final electrical system is installed.
2. The general lighting and power panel boards will be circuit breaker type installed in code gauge galvanized sheet steel cabinets complete with hinged doors, cylinder locks and typed directories. All panelboards will be a dead front design with copper bus bars, a ground bus and neutral bus. All circuit breakers will be molded case, bolt-on type, thermal-magnetic trip, single, two or three-pole as necessary.
3. All classroom, office space and common areas will have dedicated 20 amp circuits with a maximum of five (5) convenience receptacles on each branch. The space will also have dedicated 20 amp computer grade, isolated ground, receptacles with a maximum of three (3) receptacles on each branch.
4. An emergency generator will be provided for the building to sustain emergency branch equipment and optional standby mechanical, electrical and plumbing systems. Emergency and egress lighting, fire alarm control panels, fire pumps, boilers with associated pumps, ATC control systems, freezers/condensers, dedicated kitchen equipment, and emergency receptacles throughout the building will be powered through the emergency distribution system. The campus generator will be sized to energize 25% to 35% of the connected load through an emergency distribution system which is dependent on the school's requirements.

*Fire Alarm System:*

4. The fire alarm system will be non-coded, analog-addressable system; automatic sensitivity control of certain smoke detectors; and multiplexed signal transmission dedicated to fire alarm service only. Each floor shall be group zoned according to the smoke partition construction, with further breakdown as to the device type. Additional zones shall be dedicated but not limited to:
  - a. Individual Air Handling Units
  - b. Elevator Capture Control
  - c. Elevator Shunt Trip Control

*Clock and Communications Program:*

A voice and data distribution system will be provided for a complete backbone and horizontal cabling infrastructure to support communications. The backbone will consist of fiber optic and multi-pair copper cables that extend from the building's main demarcation frame MDF Room (6E) to the satellite Intermedia TE demarcation frame Rooms (IDF). A



Category 6E unshielded twisted pair (UTP) horizontal cabling system that provides local area network (LAN) and voice connectivity will be extended from the MDF/IDF to the work area outlets. Voice and data outlets will be provided in all classrooms, offices, library, computer lab, auditorium, and as additionally required by the program.

*Telephone System:*

A telephone system will be designed to provide voice communications within the school, other schools in the district, and to locations outside the school voice network. The system will include a PBX, digital and analog handsets, interface with Public Address System, E911 capability, and additional features as developed during the programming states.

*Local Sound System:*

A local sound system will be provided in the Auditorium, Gymnasium and other spaces where large groups gather. The system will provide speech and performance reinforcement and reproduction of audio sources from CD and DVD players, AM/FM radio, and other devices.

*Video Distribution System:*

A video cabling system will be provided for the distribution of CATV service provider and/or central media system signals, to outlets located throughout the building. The system will consist of a head end equipment rack, backbone and horizontal coaxial cabling, taps, splitters and outlets. Outlets will be provided in all classrooms, library, computer lab, cafeteria, gymnasium, and as additionally required by the program.

*Clock and Program System:*

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. The system will consist of a master control unit, indicating clocks, and connections to the public address and music system.

*Public Address System:*

A public address, music and intercommunication system will be provided consisting of a main console, microphones, amplifiers, AM/FM tuner, audio CD player, speakers, wiring, telephone paging adapter, clock/program system interface, room call switches, and classroom telephone handsets. The system will allow broadcasting of program one signals for classroom changes, radio and CD program material, and telephone and microphone originated announcements to all areas throughout the building by individual area or on an all-call basis.

*Electronic Safety and Security System:*

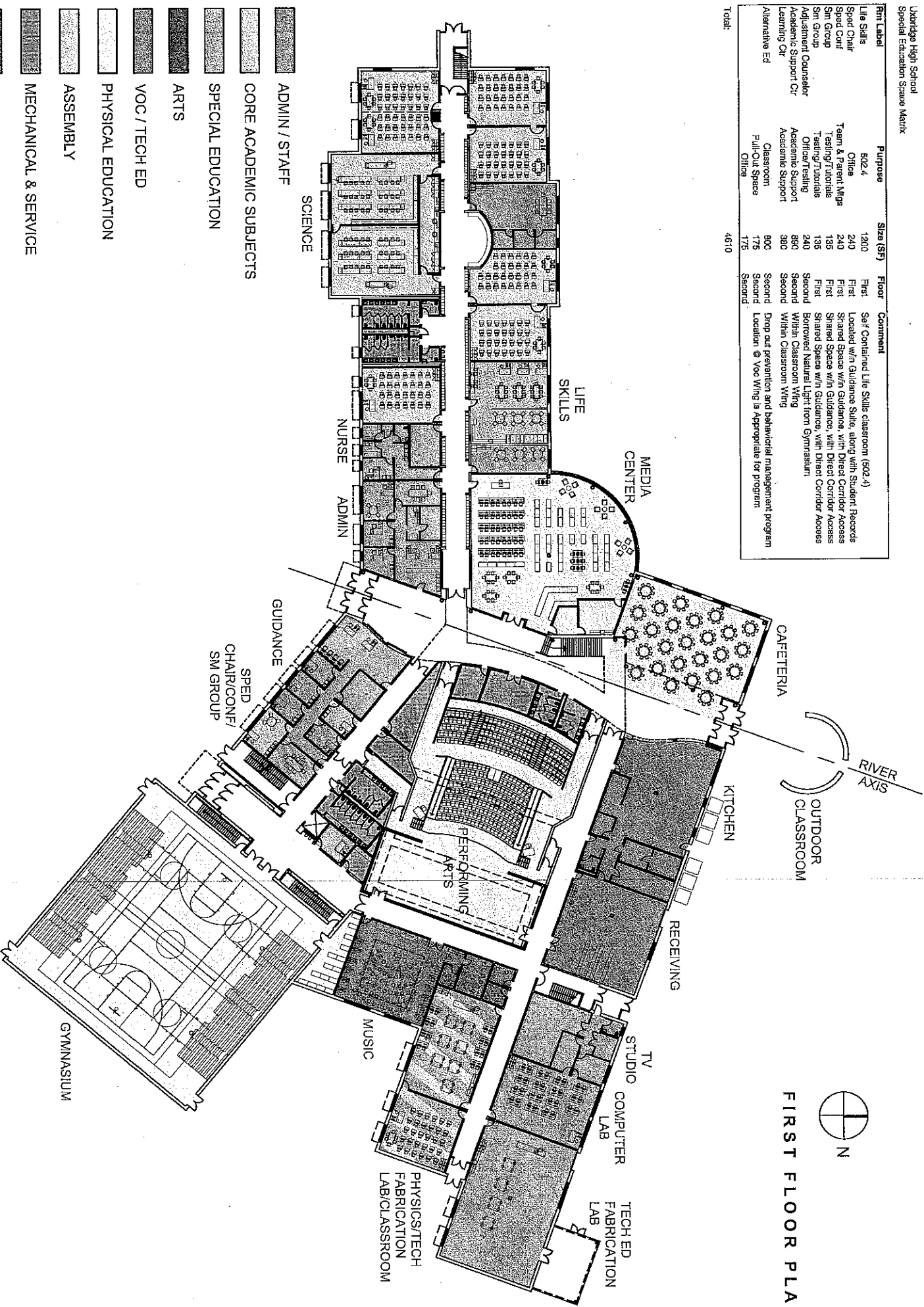
A hard wired building security system will be provided to protect the building and its occupants from unauthorized entry. At minimum, this security system will consist of a main control panel, proximity readers/keypads installed at specified doors, door contact switches,



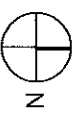
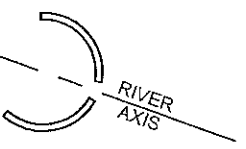
Raymond Design Associates, Inc.

a CCTV camera installed at the front entry, video intercom at the main entry with electrified lock control in the door operation, and motion detectors.

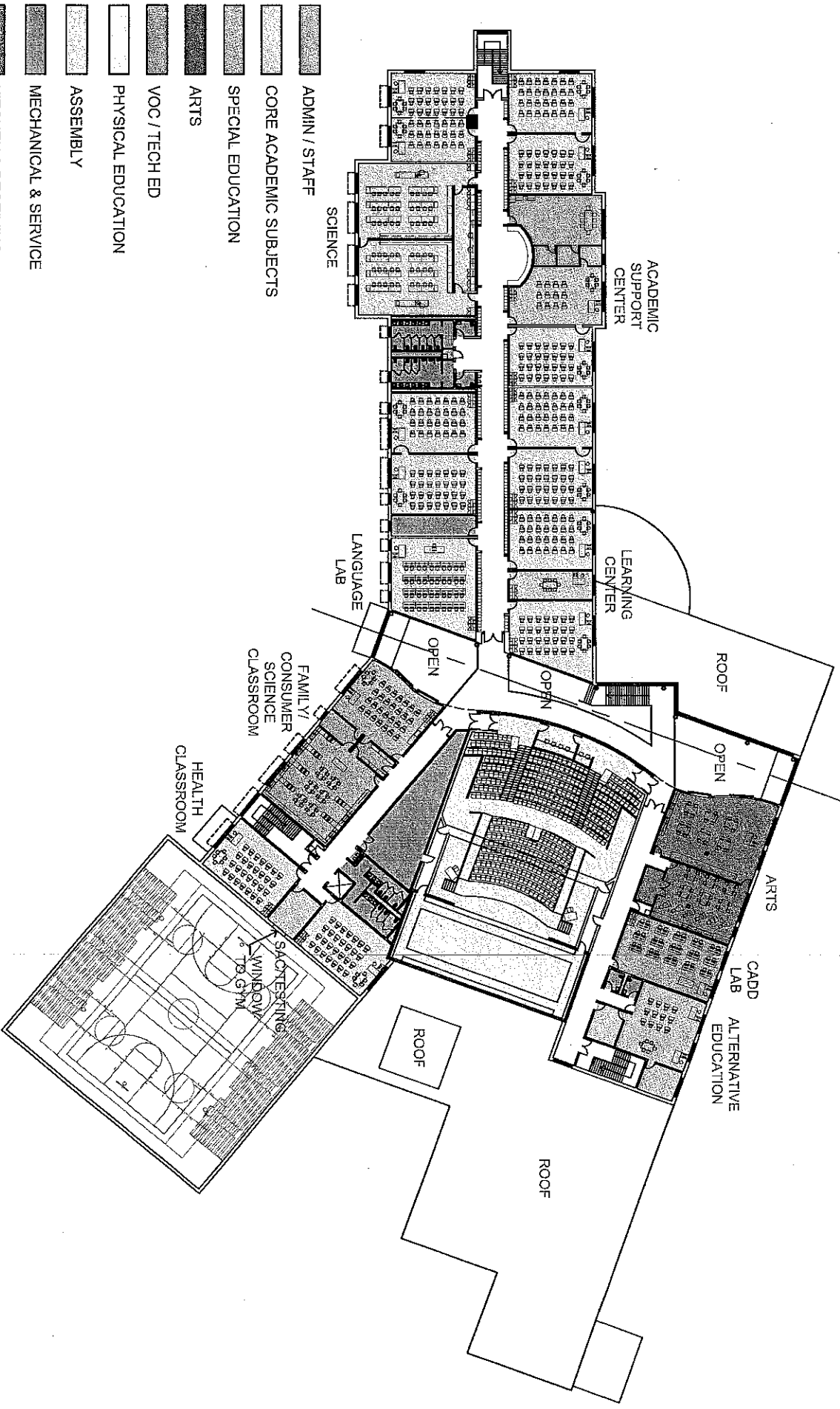
Room Label	Purpose	Size (Sf)	Floor	Comment
Life Skills	502.4	1200	First	Self Contained Life Skills classroom (502.4)
Spec Chair	Office	240	First	Located w/in Guidance Suite, along with Student Records
Spec Chair	Team & Parent Mngs	240	First	Shared Space with Guidance, with Direct Corridor Access
Sm Group	Testing/Tutorials	135	First	Shared Space with Guidance, with Direct Corridor Access
Sm Group	Office/Tutorials	135	First	Shared Space with Guidance, with Direct Corridor Access
Adjustment Counselor	Academic Support	240	Second	Borrowed Natural Light from Gymnasium
Academic Support Cr	Academic Support	890	Second	Within Classroom Wing
Learning Ctr	Academic Support	380	Second	Within Classroom Wing
Alternative Ed	Classroom	800	Second	Drop out prevention and behavioral management program
	Pull-Out Space	175	Second	Location @ Voc Wing is appropriate for program
	Office	175	Second	
Total:		4610		







SECOND FLOOR PLAN



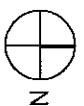
- ADMIN / STAFF
- CORE ACADEMIC SUBJECTS
- SPECIAL EDUCATION
- ARTS
- VOC / TECH ED
- PHYSICAL EDUCATION
- ASSEMBLY
- MECHANICAL & SERVICE
- KITCHEN & RECEIVING

UXBRIDGE HIGH SCHOOL

FLOOR PLANS

246 - 270 QUAKER HIGHWAY UXBRIDGE MASSACHUSETTS 01569

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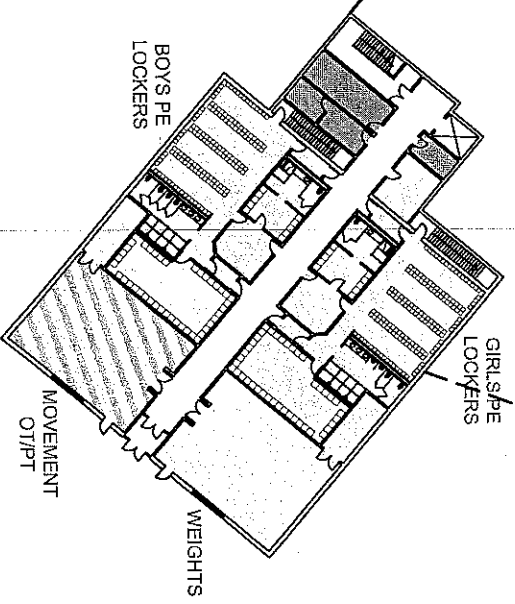


GROUND FLOOR PLAN

RIVER  
AXIS

UNEXCAVATED

UNEXCAVATED



- ADMIN / STAFF
- CORE ACADEMIC SUBJECTS
- SPECIAL EDUCATION
- ARTS
- VOC / TECH ED
- PHYSICAL EDUCATION
- ASSEMBLY
- MECHANICAL & SERVICE
- KITCHEN & RECEIVING

UXBRIDGE HIGH SCHOOL

246 - 270 QUAKER HIGHWAY UXBRIDGE MASSACHUSETTS 01569

FLOOR PLANS

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## ROOM DATA SHEETS

### General Classrooms

Floor: Resilient flooring  
Walls: Painted gypsum wallboard  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Heated and ventilated – ducted system  
Plumbing: none  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Suspended fluorescent direct / indirect; accent lighting at teaching wall  
Electrical: Duplex wall outlets  
Marker Board: 12' marker board and 8' marker board at adjacent wall  
Tack Board: 2-4' tack boards at Teaching Wall (1" tack strip above).  
Casework: (2) tall storage units  
Wardrobe: 30" wide with 2 double hooks, 2 cubbies above  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Smart Board: (1) per room  
Cable TV Outlet: (1) per room  
Computer Drops: At teacher's desk and 2 additional  
TV Monitor/Projector/Screen: Ceiling mounted projection screen; Ceiling mounted video projector



Science Labs / Prep Rooms

Floor: Resilient flooring  
Walls: Painted gypsum wallboard  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Heated and ventilated  
Plumbing: Lab sinks at all lab stations in biology and chemistry, (2) student sinks in all other science rooms, at demonstration tables in all rooms  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Suspended fluorescent direct / indirect; accent lighting at teaching wall  
Electrical: Duplex wall outlets including at all lab stations  
Marker Board: 12' marker board and 8' marker board at adjacent wall  
Tack Board: 2-4' tack boards at Teaching Wall (1" tack strip above).  
Casework: Epoxy resin countertops. Doors with science casework - wood veneer base cabinets and glass front wall cabinets. One two-sided fume hood per lab, backed up to Prep Room  
Casework: (2) tall storage units  
Wardrobe: 30" wide with 2 double hooks, 2 cubbies above  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Smart Board: (1) per room  
Cable TV Outlet: (1) per room  
Computer Drops: At teacher's desk and 2 additional  
TV Monitor/Projector/Screen: Ceiling mounted projection screen; Ceiling mounted video projector



### Art Classrooms

Floor: Resilient flooring  
Walls: Painted gypsum wallboard  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Heated and ventilated  
Plumbing: 2 sinks with plaster trap  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Suspended fluorescent direct / indirect; accent lighting at teaching wall  
Electrical: Duplex wall outlets  
Marker Board: 12' marker board and 8' marker board at adjacent wall  
Tack Board: 2-4' tack boards at Teaching Wall (1" tack strip above).  
Casework: (2) tall storage units  
Casework: Stainless steel countertops on work tables, plastic laminate countertops w/ wood veneer base cabinets and wall cabinets.  
Wardrobe: 30" wide with 2 double hooks, 2 cubbies above  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Smart Board: (1) per room  
Cable TV Outlet: (1) per room  
Computer Drops: At teacher's desk and 2 additional  
TV Monitor/Projector/Screen: Ceiling mounted projection screen; Ceiling mounted video projector



### Music Classroom

Floor: ½ Resilient flooring, ½ Carpet

Walls: Painted gypsum wallboard with acoustic panels

Wainscot/Paneling: Acoustic Wall Panels on 2 Walls

Ceiling: Acoustic ceiling panels (50% reflective)

Doors: Wood, Sidelight at door

Mechanical: Heated and ventilated

Plumbing: none

Fire Protection: A/V fire alarm and sprinkler (per NFPA code).

Lighting: Suspended fluorescent direct / indirect; accent lighting at teaching wall

Electrical: Duplex wall outlets

Marker Board: 12' marker board and 8' marker board at adjacent wall

Tack Board: 2-4' tack boards at Teaching Wall (1" tack strip above).

Casework: (2) tall storage units

Casework: (2) tall storage units; instrument storage

Wardrobe: 30" wide with 2 double hooks, 2 cubbies above

Telephone: (1) per room

Clock: (1) per room

Speaker: (1) per room

Smart Board: (1) per room

Cable TV Outlet: (1) per room

Computer Drops: At teacher's desk and 2 additional

TV Monitor/Projector/Screen: Ceiling mounted projection screen; Ceiling mounted video projector

Gymnasium

Floor: Wood Strip Flooring, sports markings

Walls: Painted block

Acoustical: Tectum panels high on walls

Ceiling: Exposed structure, Acoustical deck

Doors: Wood, Sidelights at door

Mechanical: Rooftop Unit, radiant heating along wall under windows at exterior walls

Plumbing: Drinking fountain and cuspidor, outside gymnasium

Fire Protection: A/V fire alarm and sprinkler (per NFPA code).

Lighting: HID or Hi-Bay fluorescent

Electrical: Duplex wall outlets

Equipment: Operable bleachers, backstops and divider curtain

Telephone: (1) per room

Clock: (1) per room

Speaker: (1) per room

Cable TV Outlet: One

Computer Drops: 2

TV Monitor/Projector/Screen: Ceiling mounted projection screen; Ceiling mounted video projector

TV Monitor/Projector/Screen: Large screen

Local Sound System



Media Center / Reading Room

Floor: Carpet  
Walls: Painted gypsum wallboard  
Acoustical: Acoustical Wall Panels  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Air system fully air conditioned, radiant heating at exterior walls  
Plumbing: Sink in Workroom  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Suspended fluorescent direct / indirect; accent lighting  
Electrical: Duplex wall outlets, outlets for 20+ computers and printers  
Markerboard; layout to be determined  
Tackboards; layout to be determined  
Casework: Wood and plastic laminate-clad information desk, plastic laminate countertops, doors with wood veneer base cabinets and wall cabinets in workroom  
Shelving: Fixed shelving along perimeter, loose FFE shelving in center  
Wardrobe: 30" wide with 2 double hooks, 2 cubbies above  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Smart Board: (1) per room  
Cable TV Outlet: One  
Computer Drops: At teacher's desk and 2 additional  
TV Monitor/Projector/Screen: Ceiling mounted projection screen; Ceiling mounted video projector  
Integrated (open) Computer Lab in the Reading Room





Auditorium / Drama

Floor: Painted floors under seating, carpeted aisles, wood strip flooring on stage

Walls: Painted gypsum wallboard

Wainscot/Paneling: Yes

Ceiling: Acoustic ceiling panels, GWB clouds

Acoustical: Acoustical panels on walls

Doors: Wood, Sidelight at door

Mechanical: Air system fully air conditioned, radiant heating at exterior walls

Plumbing: none

Fire Protection: A/V fire alarm and sprinkler (per NFPA code).

Lighting: Suspended fluorescent work lights on stage; theatrical lighting; dimmable house lights; aisle lighting on seating

Electrical: Duplex wall outlets, additional power at lighting and sound system controls; sound system

Marker Board: 12' marker board and 8' marker board at adjacent wall

Tackboards and tack strips as needed; layout to be determined.

Furnishings: Fixed auditorium seating

Telephone: (1) per room

Clock: (1) per room

Speaker: Performance sound system

Cable TV Outlet: 1 on stage, 1 in control room

Computer Drops: At teacher's desk and 2 additional

TV Monitor/Projector/Screen: Ceiling mounted projection screen on stage; Ceiling mounted video projector

Local Lighting and Audio Systems

Control Booth

Open Sound Mixing Board at Rear Aisle



### Cafeteria / Dining

Floor: Resilient flooring  
Walls: Painted CMU  
Acoustical: Acoustical panels on walls  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Heated and ventilated  
Plumbing: none  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Suspended fluorescent; accent lighting  
Electrical: Duplex wall outlets  
Marker Board: 12' marker board and 8' marker board at adjacent wall  
Tackboards and tack strips as needed; layout to be determined.  
Casework: Stainless steel tray return and trash receptacle/recycling area  
Furnishings: Tables and seats under FFE  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: Local sound system  
Cable TV Outlet: Two  
Computer Drops: Multiple  
TV Monitor/Projector/Screen: Ceiling mounted projection screen; Ceiling mounted video projector  
Local Sound System

### Kitchen

Floor: Epoxy resin  
Walls: Painted CMU  
Wainscot/Paneling: Tile  
Ceiling: Mylar acoustical tile  
Doors: Wood  
Mechanical: Heated and ventilated, Make-Up Air Unit at Hood  
Plumbing: As required to support equipment and hand sinks  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Lensed recessed fluorescent fixtures  
Electrical: Duplex wall outlets  
Furnishings: Lockers for staff, food service equipment  
Wardrobe: 30" wide with 2 double hooks, 2 cubbies above in Office  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Computer Drops: Two



#### Medical Suite

Floor: Resilient flooring  
Walls: Painted gypsum wallboard  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Air System, Fully Air Conditioned; Radiant heating at Exterior walls  
Plumbing: Sink, Unisex Toilet Room, Eyewash  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Recessed fluorescent  
Electrical: Duplex wall outlets  
Tack Board: 2-4' tack boards at Teaching Wall (1" tack strip above).  
Casework: Plastic laminate clad countertops and doors with wood veneer base cabinets and wall cabinets  
Wardrobe: 30" wide with 2 double hooks, 2 cubbies above  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Computer Drops: Two

#### Administrative / Guidance Suites

Floor: Carpet and Resilient Flooring  
Walls: Painted gypsum wallboard  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Air System, Fully Air Conditioned; Radiant heating at Exterior walls  
Plumbing: Sink in General Office, Two Unisex Toilets  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Suspended fluorescent direct / indirect  
Electrical: Duplex wall outlets  
Markerboard; (1) 4' unit, each per room.  
Tack Board: (1) 4' unit, each per room  
Casework: Plastic laminate clad countertops and doors with wood veneer base cabinets and wall cabinets in General Office  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Smart Board: (1) at conference room  
Cable TV Outlet: (1) at conference room  
Computer Drops: (1) per room  
TV Monitor/Projector/Screen: Ceiling mounted projection screen at conference room  
Vision Panels to Front Entry Lobby



Computer Labs / Language Lab

Floor: Resilient flooring  
Walls: Painted gypsum wallboard  
Ceiling: Acoustic ceiling panels  
Doors: Wood, Sidelight at door  
Mechanical: Air System (Air Conditioned); radiant heating at exterior walls  
Plumbing: none  
Fire Protection: A/V fire alarm and sprinkler (per NFPA code).  
Lighting: Suspended fluorescent with up and down component; accent lighting at teaching wall  
Electrical: Duplex wall outlets to support 24 computers and peripherals  
Marker Board: 16' marker board  
Tack Board: (2) 4' tack boards  
Casework: (2) tall storage units  
Wardrobe: 30" wide with 2 double hooks, 2 cubbies above  
Telephone: (1) per room  
Clock: (1) per room  
Speaker: (1) per room  
Smart Board: (1) per room  
Cable TV Outlet: (1) per room  
Computer Drops: At teacher's desk and 2 additional  
TV Monitor/Projector/Screen: Ceiling mounted projector and projection screen



**FUTURE  
EXPANSION**

**Raymond Design  
Associates, Inc.  
Architects & Planners**  
222 North Street  
Hingham, MA 02043

246 - 270 Quaker Highway Uxbridge Massachusetts 01569

Revisions:	
No.	Date Description

Drawn By	JSL
Checked By	RR
Approved By	MG
Drawing Scale	1/16" = 1'-0"
Project Number	94-1-100
Date	10/28/91

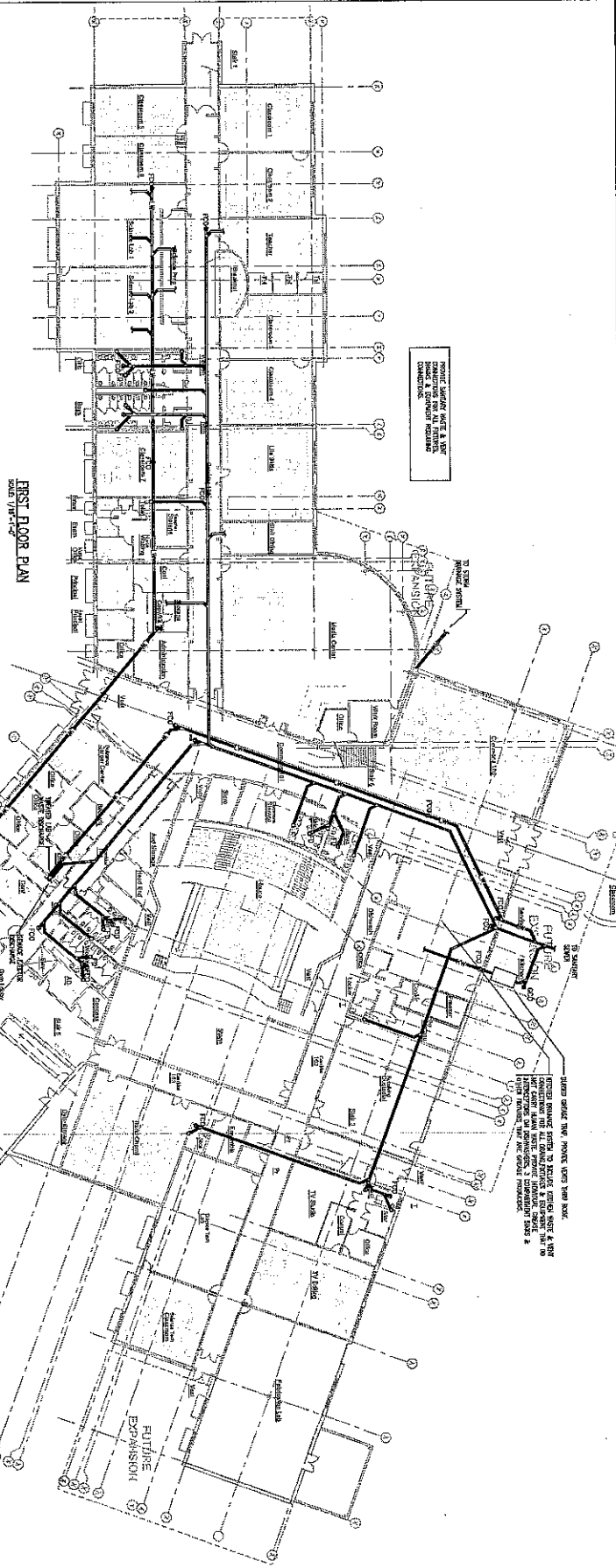
## FA2.2





### FP2.3

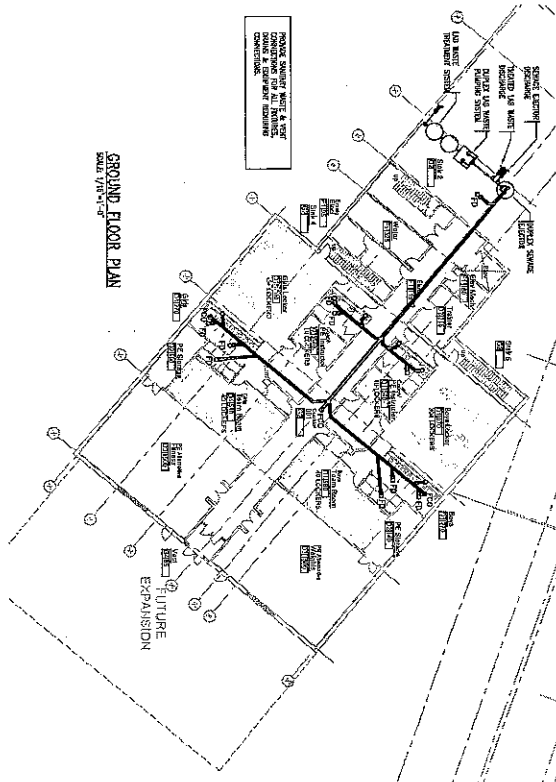
PROVIDE SANITARY WASTE & VENT  
CONNECTIONS FOR ALL FIXTURES,  
PLUMBS & EQUIPMENT REQUIRING  
CONNECTIONS.



**FIRST FLOOR PLAN**  
SCALE: 1/16"=1'-0"

STITCHER DRAINAGE SYSTEM TO INCLUDE KITCHEN WASTE & WASH CONNECTIONS FOR ALL ROOMS, FURNITURE & EQUIPMENT THAT DO NOT CARRY HUMAN WASTE. PROVIDE ADDITIONAL CHANGE INTERCEPTORS ON DRAINAGES, 3 COLLECTOR/DRAIN SINKS & OTHER FEATURES THAT ARE CRITICAL PRODUCTS.

PRODUCING QUALITY WASTE & WATER  
CONNECTIONS FOR ALL PREMISES,  
DOWNS & EQUIPMENT MAINTENANCE  
CONNECTIONS.



**GROUND FLOOR PLAN**  
SCALE 1/16"=1'-0"

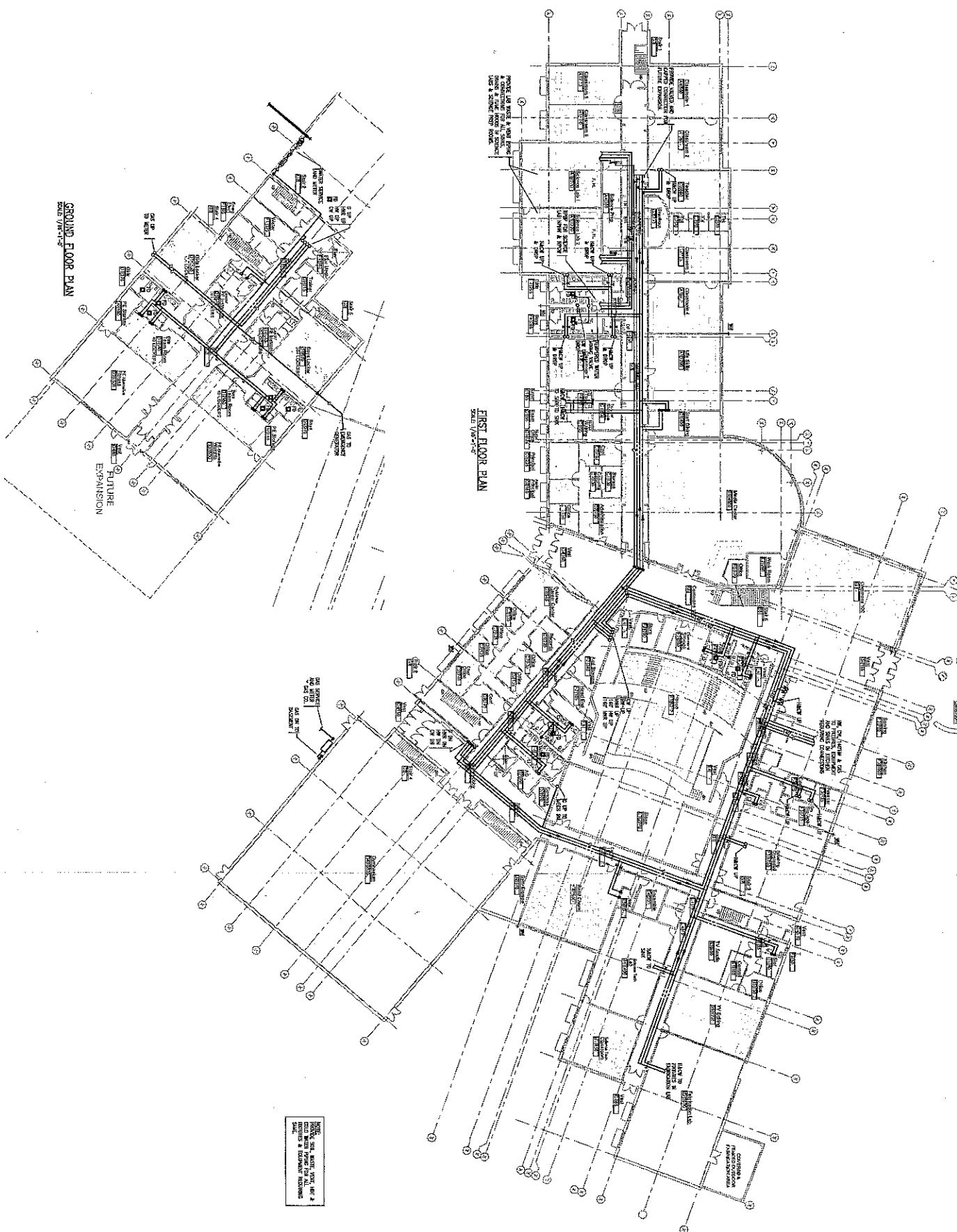
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**Uxbridge High School**  
246 - 270 Quaker Highway Uxbridge Massachusetts 01569

### PLUMBING UNDER SLAB PIPING PLAN

**Raymond Design  
Associates, Inc.**  
Architects & Planner  
222 North Street  
Hingham, MA 02045





**Uxbridge High School**  
246 - 270 Quaker Highway Uxbridge Massachusetts 01569

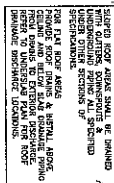
**PLUMBING FIRST & GROUND FLOOR PLANS**

Raymond Design  
Associates, Inc.  
Architects & Planners  
222 North Street  
Hingham, MA 02043

AD

Checked By	MJH
Approved By	MJH
Drawing Scale	AS NOTED
Project Number	84-1100
Date	10/6/11

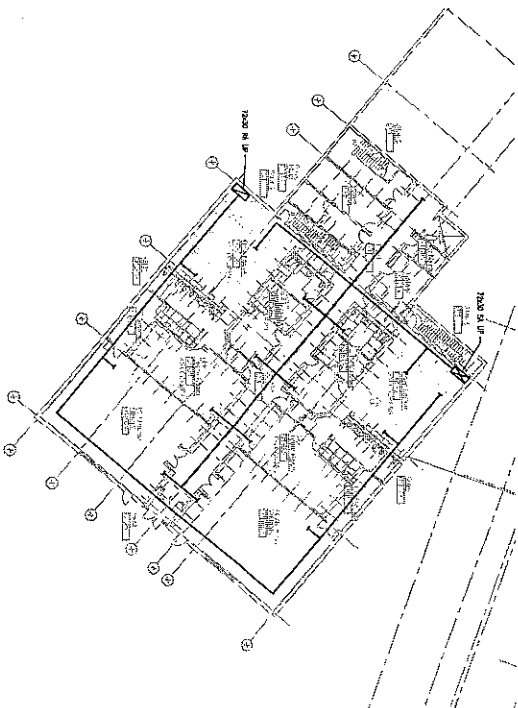
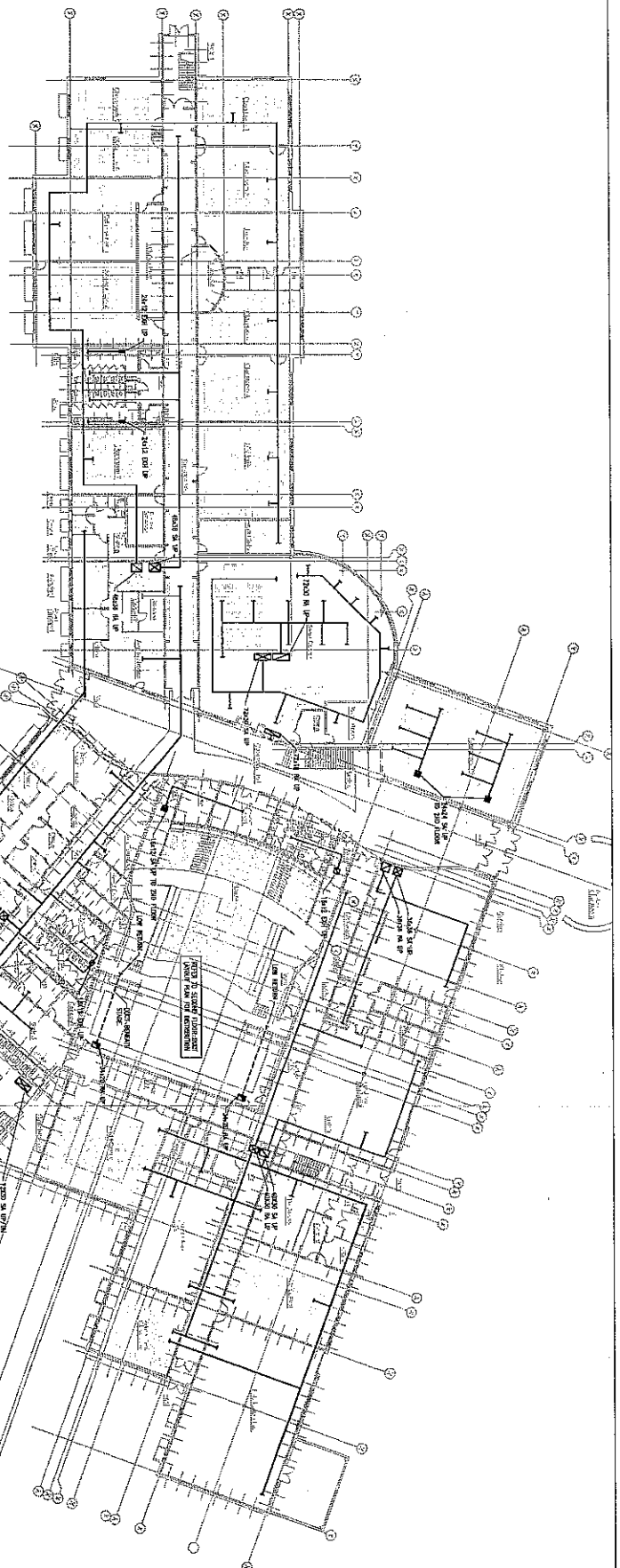
P2.1



ALTERNATE "A" ROOF CONCEPT  
SCALE: 1/32"=1'-0"



**BASE BID ROOF CONCEPT**  
SCALE: 1/32" = 1'-0"

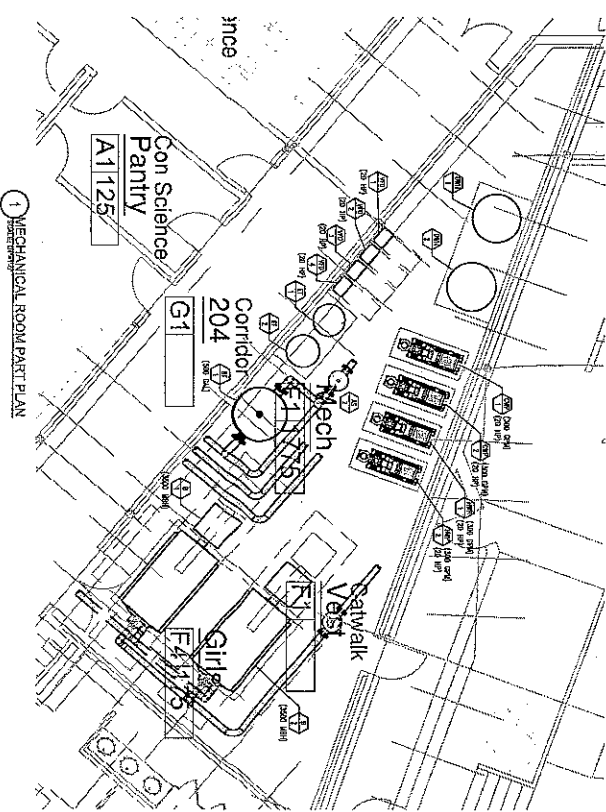


1 FIRST FLOOR PLAN

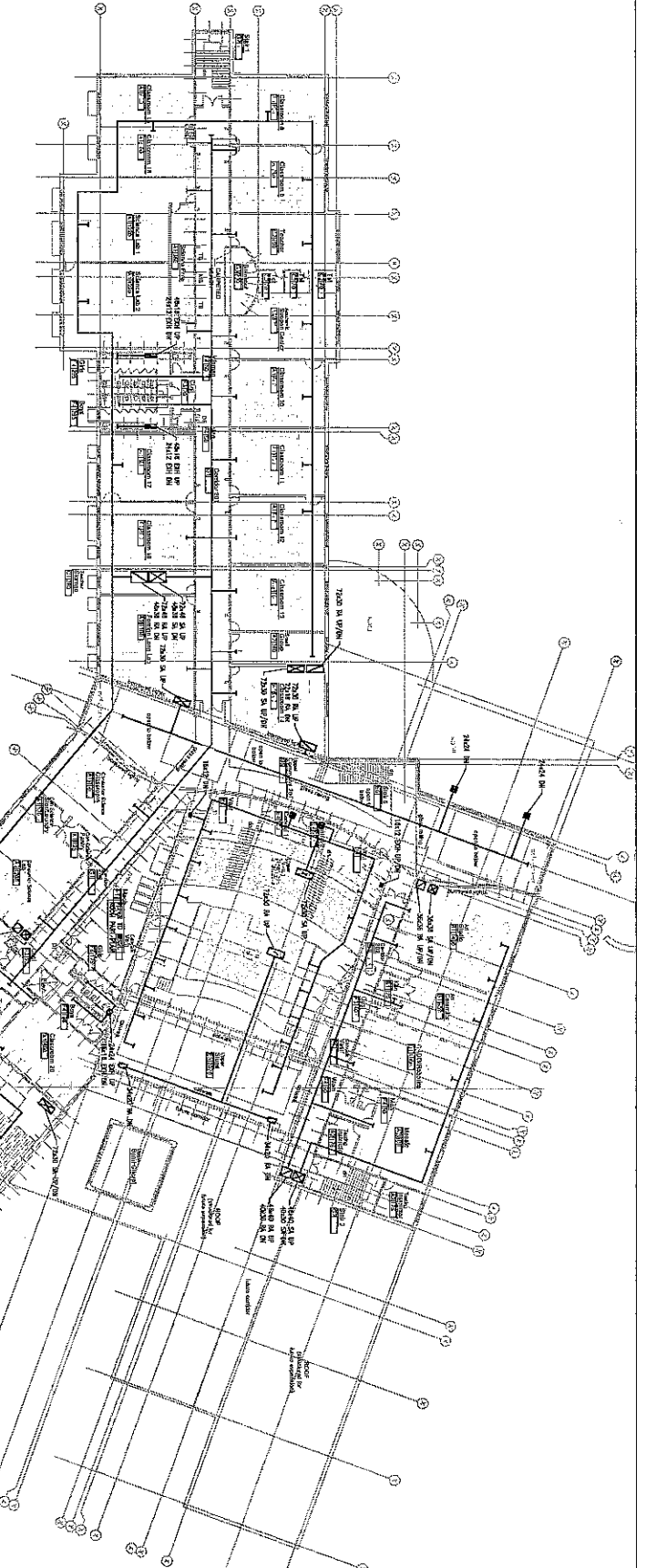
2 GROUND FLOOR PLAN  
SCALE 1/16"

[illegible]





1 SECOND FLOOR PLAN



**Uxbridge High School**  
246 - 270 Quaker Highway Uxbridge Massachusetts 01569

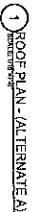
**HVAC - SECOND FLOOR PLAN**

**RDA**

Raymond Design  
Associates, Inc.  
Architects & Planners  
222 North Street  
Hingham, MA 02043

No.	Desc.	Quantity
1	Con Science Pantry	1
2	Corridor 204	1
3	Mech	1
4	F1125	1
5	F1126	1
6	F1127	1
7	F1128	1
8	F1129	1
9	F1130	1
10	F1131	1
11	F1132	1
12	F1133	1
13	F1134	1
14	F1135	1
15	F1136	1
16	F1137	1
17	F1138	1
18	F1139	1
19	F1140	1
20	F1141	1
21	F1142	1
22	F1143	1
23	F1144	1
24	F1145	1
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73	F1194	1
74	F1195	1
75	F1196	1
76	F1197	1
77	F1198	1
78	F1199	1
79	F1200	1

**H2.2**



H2.3A

[illegible][illegible]

- 123 **COMMUNICATIONS SYSTEMS: DESIGN**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 1-10. The authors discuss the design of a communications system for the transmission of digital data over a multipath fading channel. The system is designed to be robust to fading and to be able to adapt to changing channel conditions. The system is based on a combination of spread spectrum and adaptive equalization techniques. The authors show that the system can achieve a bit error rate of  $10^{-5}$  at a data rate of 100 kbps. The system is also able to adapt to changes in the channel delay spread and to changes in the channel fading rate. The authors conclude that the system is a promising candidate for use in mobile communications systems.
- 124 **ADAPTIVE SIGNAL PROCESSING**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 11-20. The authors discuss the design of an adaptive signal processing system for the detection of signals in a noisy environment. The system is designed to be robust to noise and to be able to adapt to changing noise conditions. The system is based on a combination of adaptive filtering and adaptive thresholding techniques. The authors show that the system can achieve a detection probability of 0.9 at a false alarm rate of  $10^{-3}$ . The system is also able to adapt to changes in the signal-to-noise ratio and to changes in the noise power spectral density. The authors conclude that the system is a promising candidate for use in signal processing systems.
- 125 **ADAPTIVE SIGNAL PROCESSING**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 21-30. The authors discuss the design of an adaptive signal processing system for the estimation of parameters of a signal in a noisy environment. The system is designed to be robust to noise and to be able to adapt to changing noise conditions. The system is based on a combination of adaptive filtering and adaptive least squares techniques. The authors show that the system can achieve a mean square error of  $10^{-3}$  at a signal-to-noise ratio of 10 dB. The system is also able to adapt to changes in the signal parameters and to changes in the noise power spectral density. The authors conclude that the system is a promising candidate for use in signal processing systems.
- 126 **ADAPTIVE SIGNAL PROCESSING**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 31-40. The authors discuss the design of an adaptive signal processing system for the detection of signals in a noisy environment. The system is designed to be robust to noise and to be able to adapt to changing noise conditions. The system is based on a combination of adaptive filtering and adaptive thresholding techniques. The authors show that the system can achieve a detection probability of 0.9 at a false alarm rate of  $10^{-3}$ . The system is also able to adapt to changes in the signal-to-noise ratio and to changes in the noise power spectral density. The authors conclude that the system is a promising candidate for use in signal processing systems.
- 127 **ADAPTIVE SIGNAL PROCESSING**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 41-50. The authors discuss the design of an adaptive signal processing system for the estimation of parameters of a signal in a noisy environment. The system is designed to be robust to noise and to be able to adapt to changing noise conditions. The system is based on a combination of adaptive filtering and adaptive least squares techniques. The authors show that the system can achieve a mean square error of  $10^{-3}$  at a signal-to-noise ratio of 10 dB. The system is also able to adapt to changes in the signal parameters and to changes in the noise power spectral density. The authors conclude that the system is a promising candidate for use in signal processing systems.
- 128 **ADAPTIVE SIGNAL PROCESSING**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 51-60. The authors discuss the design of an adaptive signal processing system for the detection of signals in a noisy environment. The system is designed to be robust to noise and to be able to adapt to changing noise conditions. The system is based on a combination of adaptive filtering and adaptive thresholding techniques. The authors show that the system can achieve a detection probability of 0.9 at a false alarm rate of  $10^{-3}$ . The system is also able to adapt to changes in the signal-to-noise ratio and to changes in the noise power spectral density. The authors conclude that the system is a promising candidate for use in signal processing systems.
- 129 **ADAPTIVE SIGNAL PROCESSING**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 61-70. The authors discuss the design of an adaptive signal processing system for the estimation of parameters of a signal in a noisy environment. The system is designed to be robust to noise and to be able to adapt to changing noise conditions. The system is based on a combination of adaptive filtering and adaptive least squares techniques. The authors show that the system can achieve a mean square error of  $10^{-3}$  at a signal-to-noise ratio of 10 dB. The system is also able to adapt to changes in the signal parameters and to changes in the noise power spectral density. The authors conclude that the system is a promising candidate for use in signal processing systems.
- 130 **ADAPTIVE SIGNAL PROCESSING**  
A. GARDNER AND S. H. WILSON, *Journal of Electronic Communications*, 1991, 16, 1, 71-80. The authors discuss the design of an adaptive signal processing system for the detection of signals in a noisy environment. The system is designed to be robust to noise and to be able to adapt to changing noise conditions. The system is based on a combination of adaptive filtering and adaptive thresholding techniques. The authors show that the system can achieve a detection probability of 0.9 at a false alarm rate of  $10^{-3}$ . The system is also able to adapt to changes in the signal-to-noise ratio and to changes in the noise power spectral density. The authors conclude that the system is a promising candidate for use in signal processing systems.

[illegible][illegible][illegible][illegible]

**Uxbridge High School**  
Highway Uxbridge Massachusetts 01569

**ELECTRICAL LEGEND**

[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]

**Uxbridge High School**  
Quaker Highway Uxbridge Massachusetts

**ELECTRICAL LEGEND**

[illegible]


123  
A


NOTES: 1. ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE BY THE INDICATED CLASSIFICATION AND EXTENSION CODES. 2. THIS DOCUMENT IS THE PROPERTY OF THE U.S. GOVERNMENT AND IS LOANED TO YOUR AGENCY; IT AND ITS CONTENTS ARE NOT TO BE DISTRIBUTED OUTSIDE YOUR AGENCY.


COMMUNICATION SYSTEM LEGEND


1. MONITORING JAMES CAGNEY	2. ESTABLISHMENT
3. MURDERING MARY CAGNEY	4. JAMES CAGNEY LOCATED
5. MURDERING MARY CAGNEY	6. JAMES CAGNEY
7. MURDERING MARY CAGNEY	8. JAMES CAGNEY
9. MURDERING MARY CAGNEY	10. JAMES CAGNEY
11. MURDERING MARY CAGNEY	12. JAMES CAGNEY
13. MURDERING MARY CAGNEY	14. JAMES CAGNEY
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49. MURDERING MARY CAGNEY	50. JAMES CAGNEY
51. MURDERING MARY CAGNEY	52. JAMES CAGNEY
53. MURDERING MARY CAGNEY	54. JAMES CAGNEY
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57. MURDERING MARY CAGNEY	58. JAMES CAGNEY
59. MURDERING MARY CAGNEY	60. JAMES CAGNEY
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67. MURDERING MARY CAGNEY	68. JAMES CAGNEY
69. MURDERING MARY CAGNEY	70. JAMES CAGNEY
71. MURDERING MARY CAGNEY	72. JAMES CAGNEY
73. MURDERING MARY CAGNEY	74. JAMES CAGNEY
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79. MURDERING MARY CAGNEY	80. JAMES CAGNEY
81. MURDERING MARY CAGNEY	82. JAMES CAGNEY
83. MURDERING MARY CAGNEY	84. JAMES CAGNEY
85. MURDERING MARY CAGNEY	86. JAMES CAGNEY
87. MURDERING MARY CAGNEY	88. JAMES CAGNEY
89. MURDERING MARY CAGNEY	90. JAMES CAGNEY
91. MURDERING MARY CAGNEY	92. JAMES CAGNEY
93. MURDERING MARY CAGNEY	94. JAMES CAGNEY
95. MURDERING MARY CAGNEY	96. JAMES CAGNEY
97. MURDERING MARY CAGNEY	98. JAMES CAGNEY
99. MURDERING MARY CAGNEY	100. JAMES CAGNEY


— HOOKS — SET HOOKS KEY


—  HOOKS WITH 1/2" x 1/4" HOOKS


—  HOOKS WITH 1/2" x 1/4" HOOKS


—  HOOKS WITH 1/2" x 1/4" HOOKS


—  HOOKS WITH 1/2" x 1/4" HOOKS


—  HOOKS WITH 1/2" x 1/4" HOOKS


—  HOOKS WITH 1/2" x 1/4" HOOKS


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—  HOOKS WITH 1/2" x 1/4" HOOKS

—  HOOKS WITH 1/2" x 1/4" HOOKS

[illegible]

6. What are the **phenomena and results** of **social** **change**?

[illegible]

ts 01569	
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1. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
2. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
3. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
4. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
5. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
6. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
7. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
8. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
9. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.
10. **CLAUSTRAL SOLITARY AND LUTHERANISM** (1994) is a book by the author of *THE MERRY GENTLE*. It is a collection of essays on the relationship between the religious and the secular in the lives of the English writers of the 17th century.

[illegible][illegible][illegible]

**5** ELECTRIC GUITAR

**6** ELECTRIC GUITAR

**7** VOICES (GUITAR AND SYNTHESIS) BY DOOP

**8** VOICES (GUITAR AND SYNTHESIS)

**9** VOICES (GUITAR AND SYNTHESIS) WITH CHORUS

**10** VOICES (GUITAR BY MUSICIST)

**[END]** SOUNTECH SPECIAL GUITAR CHANNEL TV CHANNEL

**NOTE:** SOUNTECH TRANSMITTERS HAVE RANGE OF 1/2 MILE AND ARE 1" CIRCUMFERENCE. THEY ARE DESIGNED TO BE USED IN A ROOM OR OFFICE. THEY ARE NOT DESIGNED TO BE USED OUTDOORS. THEY ARE NOT DESIGNED TO BE USED IN A PUBLIC PLACE. THEY ARE NOT DESIGNED TO BE USED IN A PUBLIC PLACE. THEY ARE NOT DESIGNED TO BE USED IN A PUBLIC PLACE.

[illegible]

Raymond Design Associates, Inc. Architects & Planners 222 North Street Hingham, MA 02043	
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**Lighting Legend**

	FLOODLIGHT: UNDER MAIN FLOODLIGHTS, REMAIN CONNECTED TO MAIN CIRCUIT. THEY ARE RELOCATED.
	TRACK LIGHTING: UNDER FLOODLIGHTS, REMAIN CONNECTED TO LINE SAFETY CIRCUIT. THEY ARE RELOCATED.
	CEILING/PAUL UNDER MAIN FLOODLIGHTS: REMAIN CONNECTED TO SERVICE CIRCUIT. THEY ARE RELOCATED.
	CEILING/PAUL UNDER MAIN FLOODLIGHTS: REMAIN CONNECTED TO SERVICE CIRCUIT. THEY ARE RELOCATED.
	CEILING/PAUL UNDER MAIN FLOODLIGHTS: REMAIN CONNECTED TO SERVICE CIRCUIT. THEY ARE RELOCATED.
	CEILING/PAUL UNDER MAIN FLOODLIGHTS: REMAIN CONNECTED TO SERVICE CIRCUIT. THEY ARE RELOCATED.

[illegible]

- ☐ JAMES - ALUMINUM INDUSTRY HUSBANDRY
- ☐ THERMAL OVERLOAD SWITCH
- ☒ INDEPENDENT SWITCH, W/ 60AMPS RATING
- ☐ FUSED INDEPENDENT SWITCH, W/ 60AMPS

$\Delta$	SALT
$\gamma$	MAGNETIC ANGLE SYMBOL, INDICATES COMPONENT OF BOONDIEN AND SPIN.
—	MAGNETIC OR SPIN, INDICATES CHARGE AND SCALED MAGNET.
$\Delta$	CODA
$\gamma$	WTE

1	SECRETARY SPECIAL ASSISTANT, PAID.
2	
3	SECRETARY SPECIAL CLERK, READER.
4	
5	SECRETARY SPECIAL READING.
6	
7	SECRETARY LADY, READER.
8	
9	SECRETARY DOGS, READER.

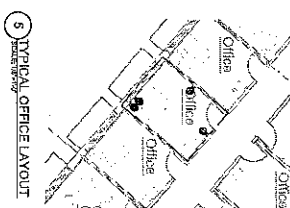
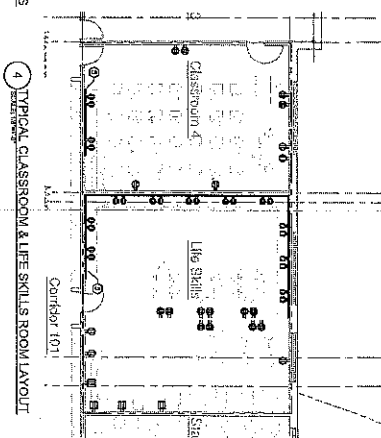
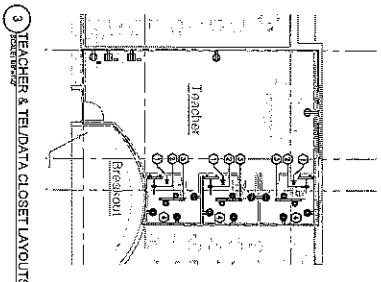
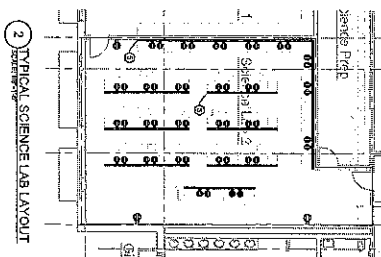
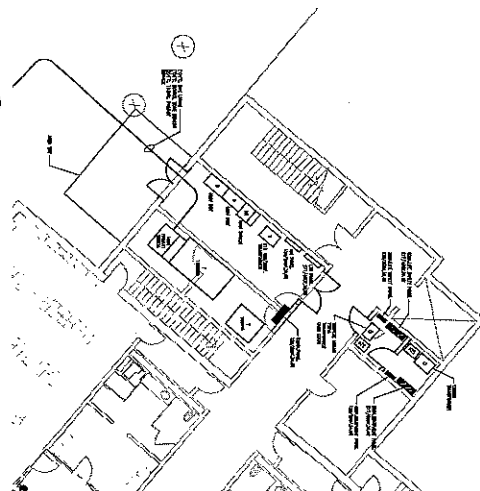
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BPDA

1





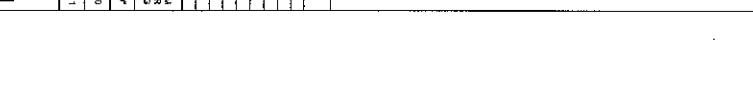
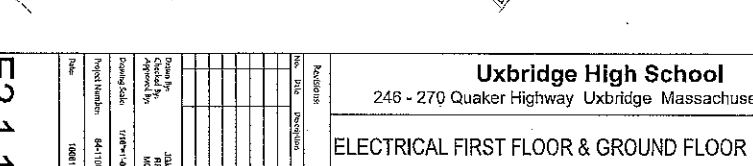
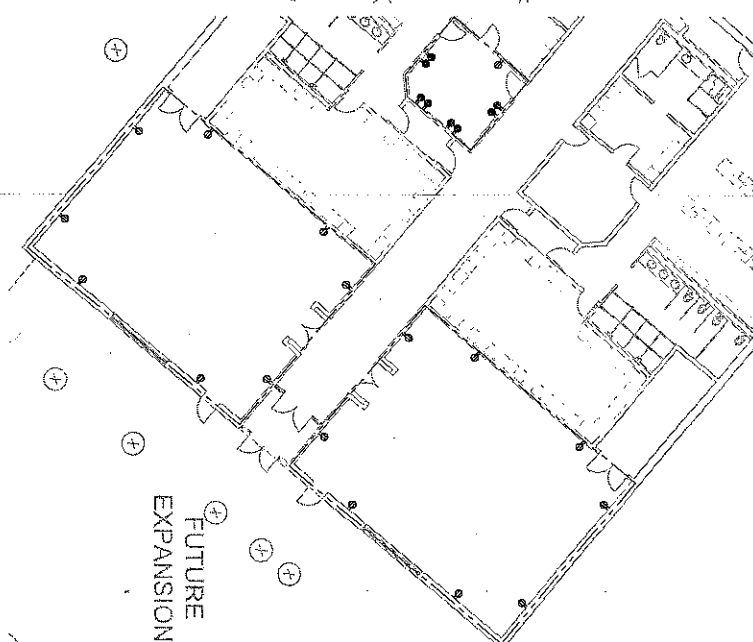
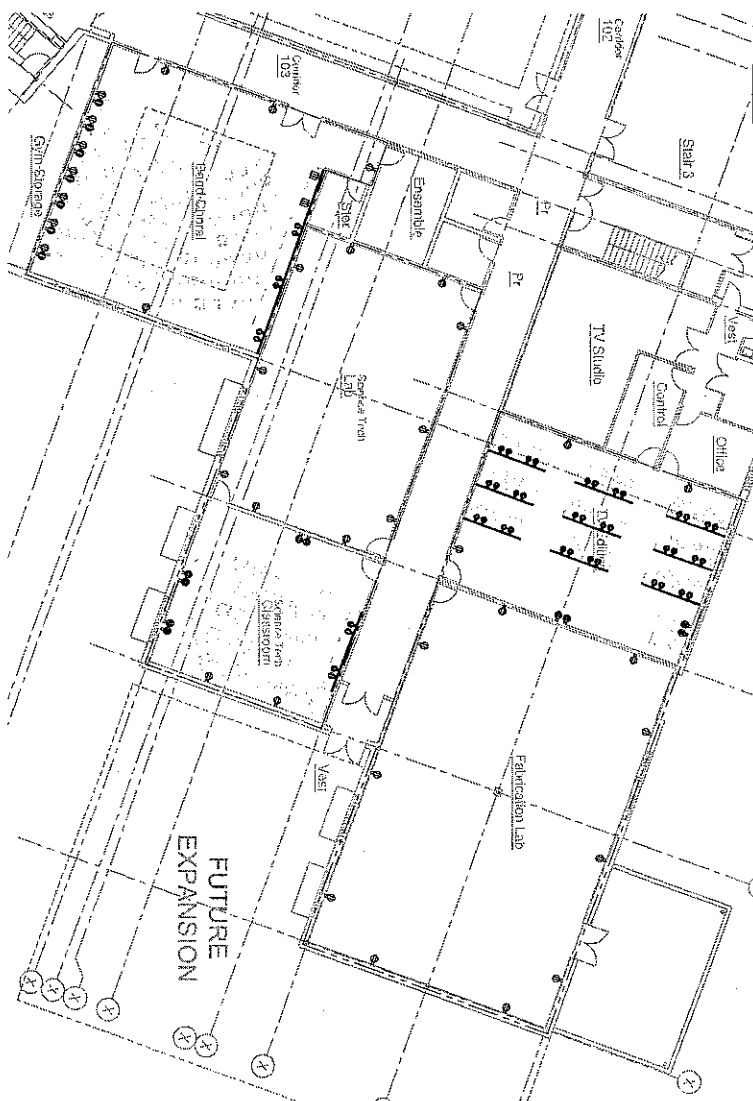


### KEYED NOTES

- ① **IT'S WELL KNOWN TO STAIN** (DESIGNING FLOOR FINISH). USE (116-3-47) AND BRUSH TO EXHAUSTIVE CLEANING.
- ② **116-6000-1** 1/4" AND BRUSH TO EXHAUSTIVE CLEANING. IN FIELD, IN AREA.
- ③ **116-6000-2** 1/4" AND BRUSH TO EXHAUSTIVE CLEANING. IN FIELD, IN AREA.
- ④ **116-6000-3** 1/4" AND BRUSH TO EXHAUSTIVE CLEANING. IN FIELD, IN AREA.
- ⑤ **116-6000-4** 1/4" AND BRUSH TO EXHAUSTIVE CLEANING. IN FIELD, IN AREA.

## GENERAL NOTES

1. REFER TO DRAWING E-1 FOR ALL SPECIAL USE, ALTERATIONS, GENERAL NOTES AND DETAILS.
2. REFER TO ARCHITECTURAL ELECTION DRAWINGS FOR EXACT LOCATIONS AND MATERIALS. HIDEWAYS OF ALL DEVICES PRIOR TO INSTALLATION.



## Uxbridge High School

246 - 270 Quaker Highway Uxbridge Massachusetts 01569

ELECTRICAL FIRST FLOOR & GROUND FLOOR PART PLANS

Raymond Design  
Associates, Inc.  
Architects & Planners  
222 North Street  
Hingham, MA 02045

222 North Street  
Hingham, MA 02043

Hingham, MA 02043



## E2.1.1



## E2.2

- GENERAL NOTES**
1. SEE SHEET E3.1 FOR GENERAL NOTES.
  2. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
  3. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
  4. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.

**RDPA**

Raymond Design  
Associates, Inc.  
Architects & Planners  
222 North Street  
Hingham, MA 02043

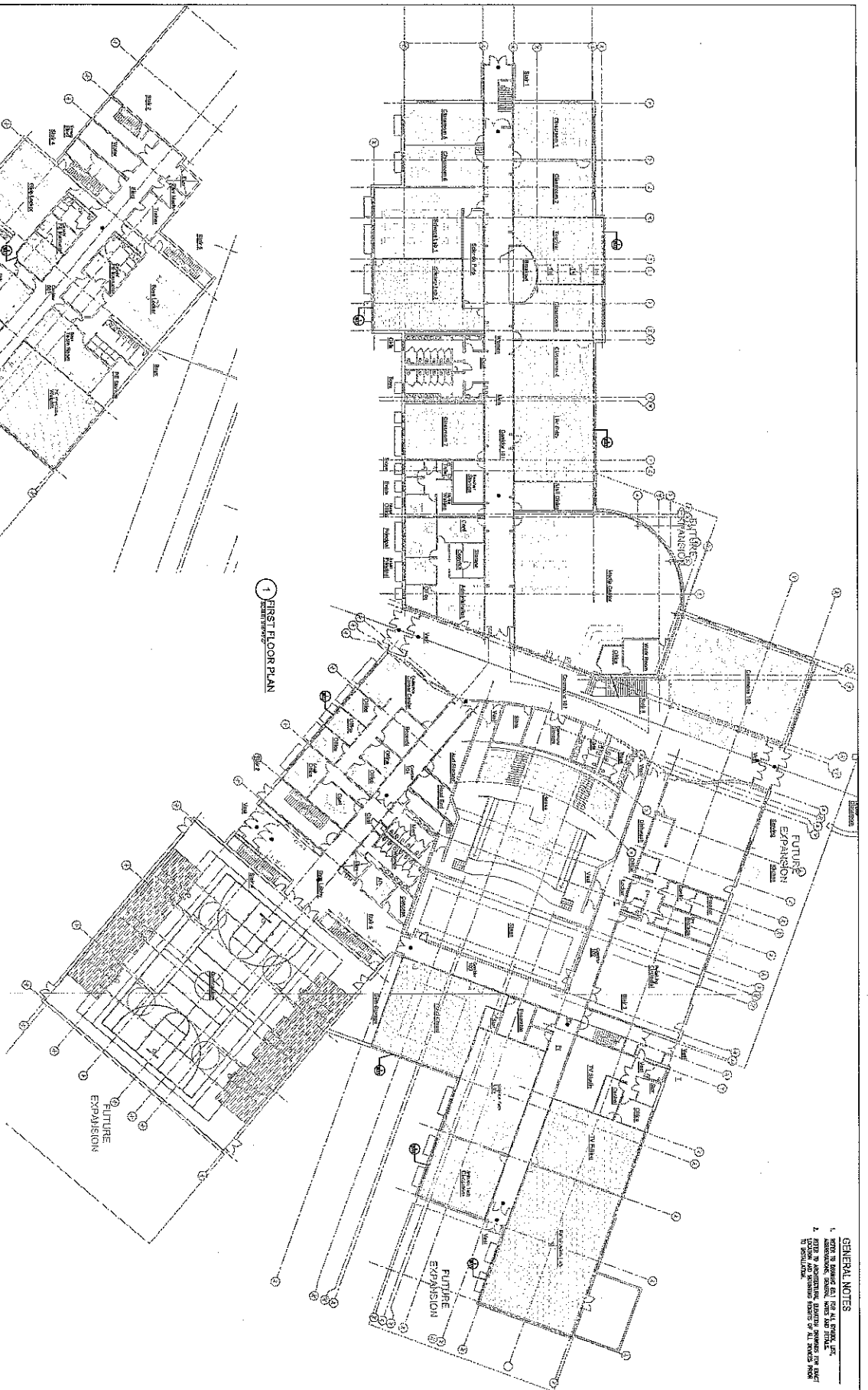
**Uxbridge High School**  
246 - 270 Quaker Highway Uxbridge Massachusetts 01569

**ELECTRICAL FIRST FLOOR & GROUND FLOOR LIGHTING PLAN**

Revision	Date	Description
1	10/08/11	Issue for Construction

Drawn by: JMB  
Checked by: JMB  
Approved by: JMB  
Project Number: 44-1500  
Date: 10/08/11

**E3.1**

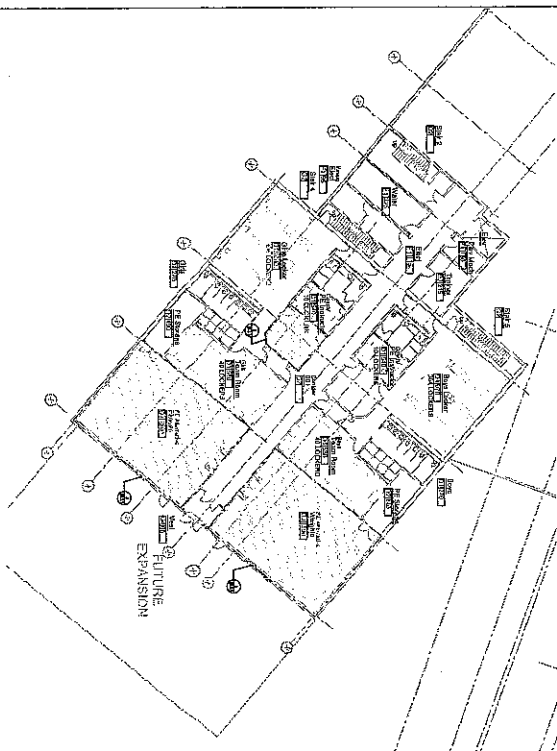


**1 FIRST FLOOR PLAN**

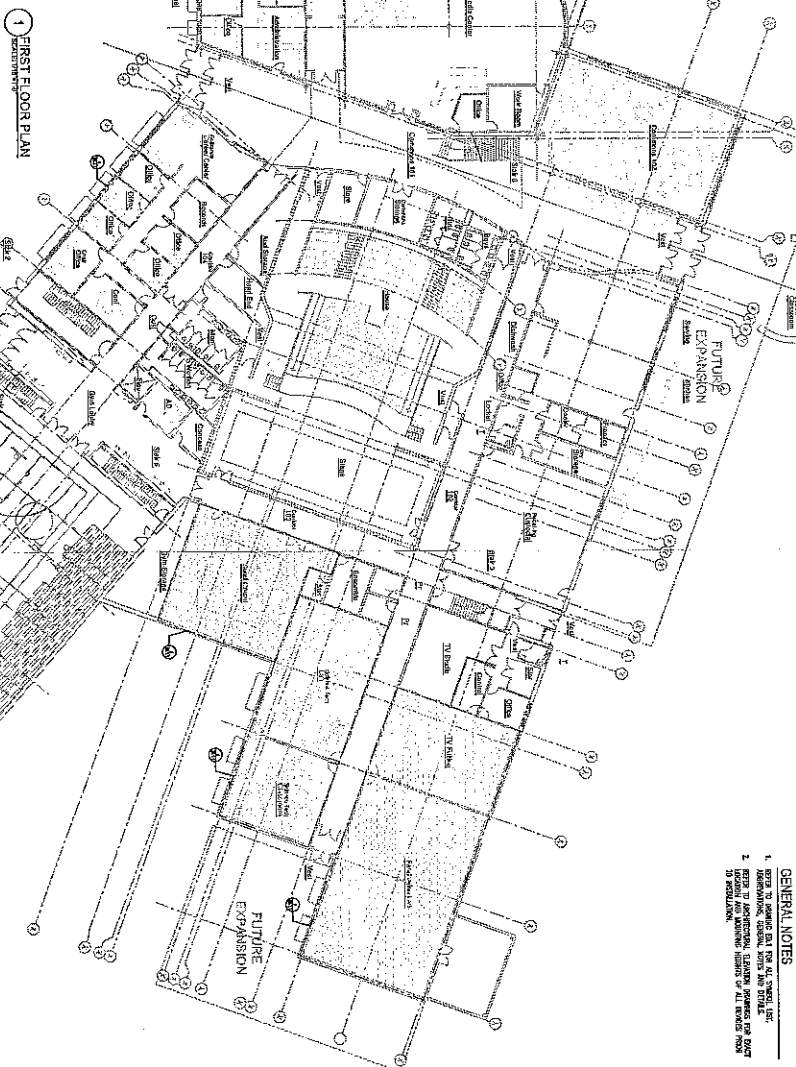
**2 GROUND FLOOR PLAN**







1 FIRST FLOOR PLAN  
SCALE 1/8" = 1'-0"



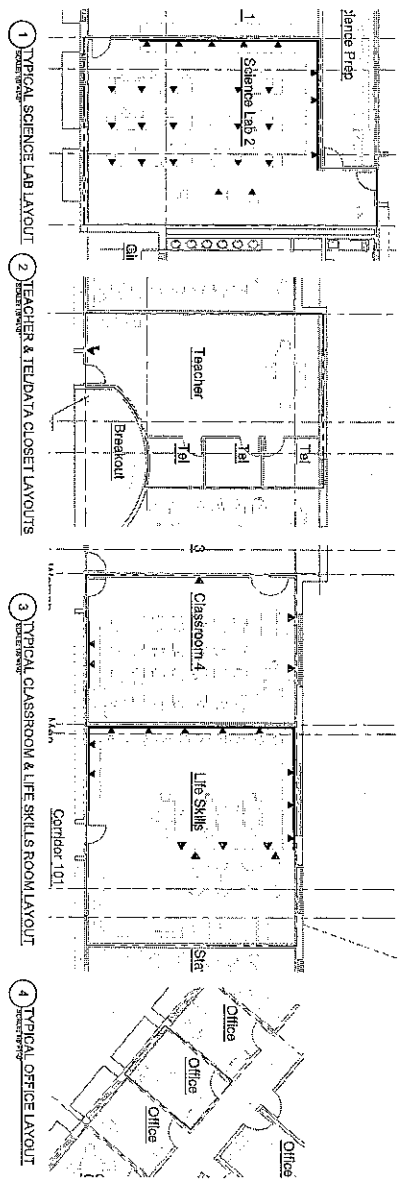
## GENERAL NOTES

**Raymond Design  
Associates, Inc.**  
Architects & Planners  
222 North Street  
Hingham, MA 02043

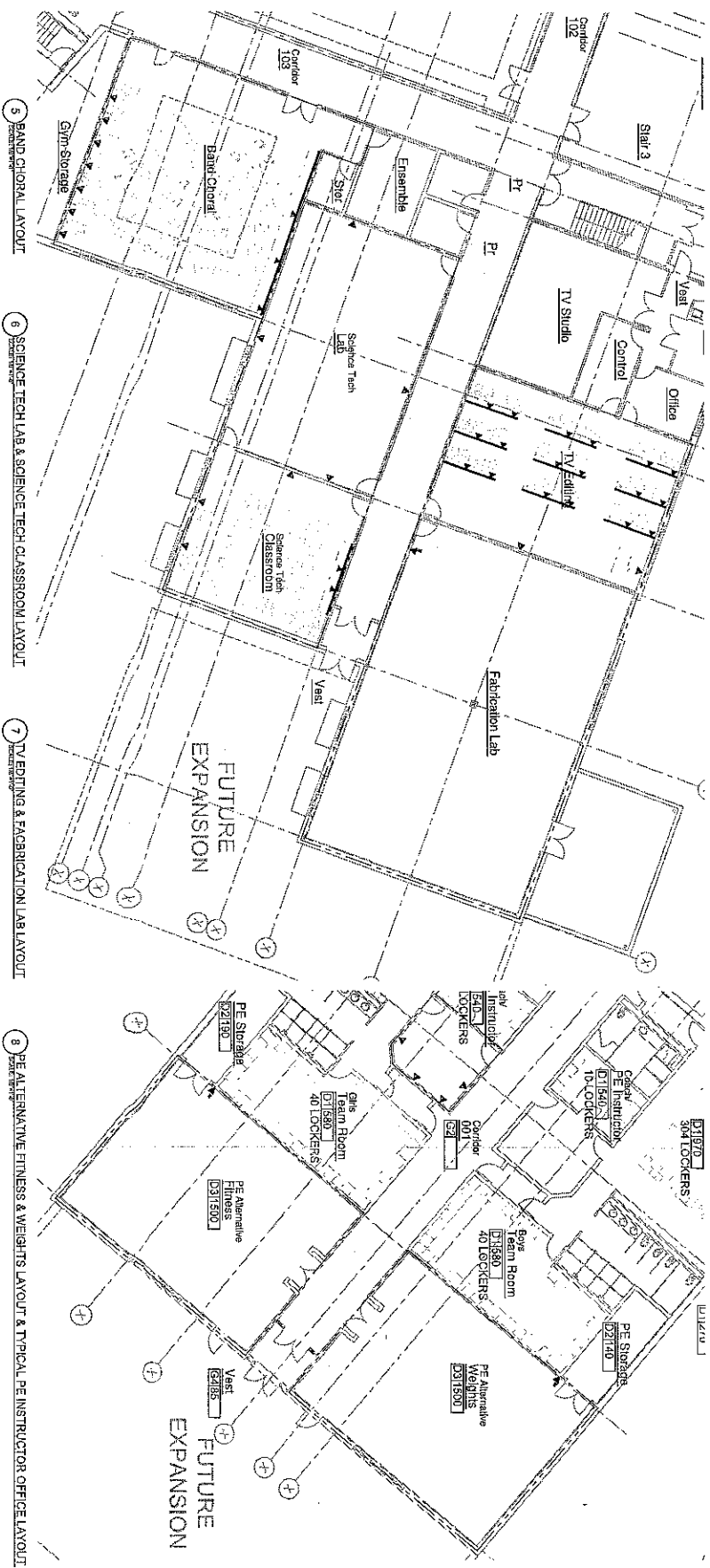
**Uxbridge High School**  
246 - 270 Quaker Highway Uxbridge Massachusetts 01569

ELECTRICAL FIRST FLOOR & GROUND FLOOR SIGNAL PLAN

<b>Revisions</b>		<b>AS NOTED</b>
No.	Date	Description
Written By _____ Checked by _____ Approved by _____		JOM RR MO
Drawing Scale:		
Project Number:	64-1100	
Date:	2008.17	



1 TYPICAL SCIENCE LAB LAYOUT 2 TEACHER & TEL/DATA CLOSET LAYOUTS 3 TYPICAL CLASSROOM & LIFE SKILLS ROOM LAYOUT 4 TYPICAL OFFICE LAYOUT



5 BAND CHORAL LAYOUT 6 SCIENCE TECH LAB & SCIENCE TECH CLASSROOM LAYOUT 7 TV EDITING & FABRICATION LAB LAYOUT 8 PE ALTERNATIVE FITNESS & WEIGHTS LAYOUT & TYPICAL PE INSTRUCTOR OFFICE LAYOUT

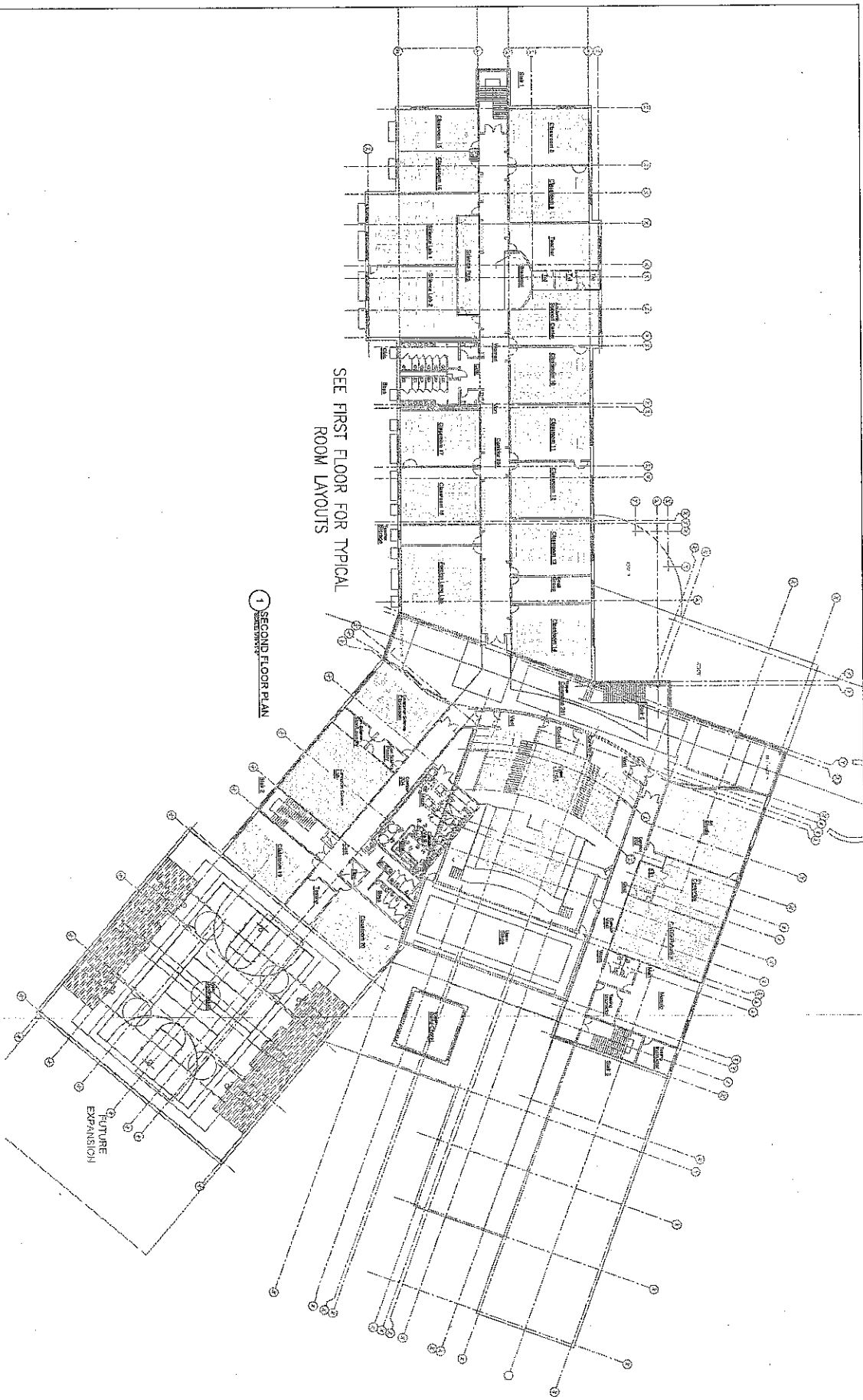
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**Raymond Design Associates, Inc.**  
 Architects & Planners  
 222 North Street  
 Hingham, MA 02043

**Uxbridge High School**  
 246 - 270 Quaker Highway Uxbridge Massachusetts 01569  
**ELECTRICAL FIRST FLOOR & GROUND FLOOR PART PLANS**

**E4.1.1**



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Birmingham, MA 02045

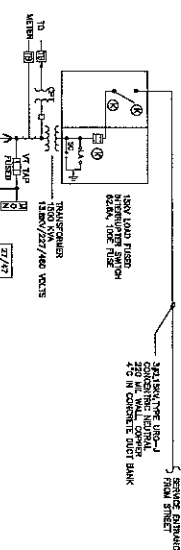
**Uxbridge High School**  
246 - 270 Quaker Highway Uxbridge Massachusetts 01569

**ELECTRICAL SECOND FLOOR SIGNAL PLAN**

Revisions	
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3	Issue for Construction
4	Issue for Construction
5	Issue for Construction
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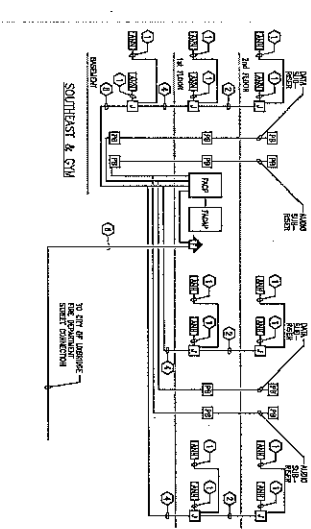
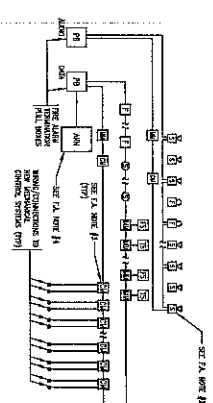
E4.2





- FIRE ALARM WIRING DIAGRAM NOTES**
1. FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL FIRE ALARM CODE (NFPA 72) AND THE MASSACHUSETTS ELECTRICAL CODE (MELC).
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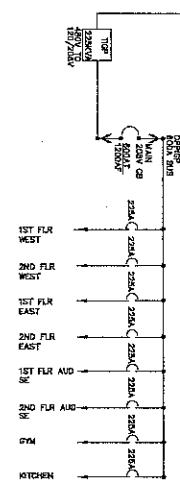
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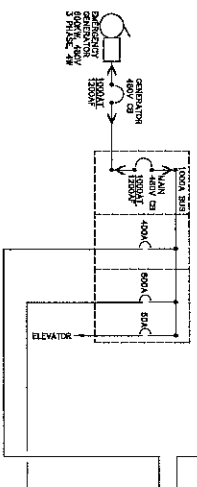
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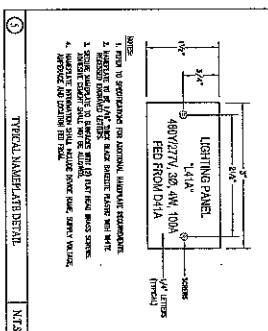
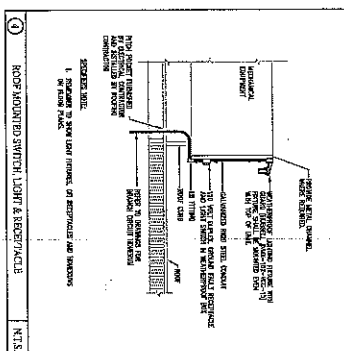
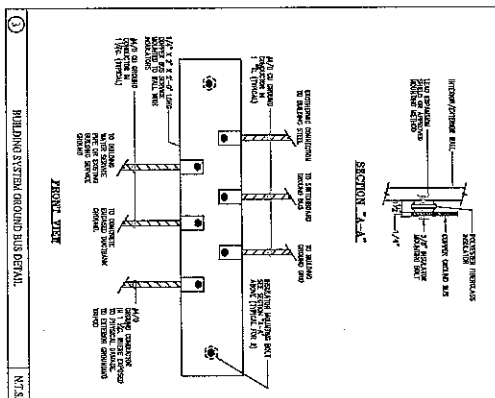
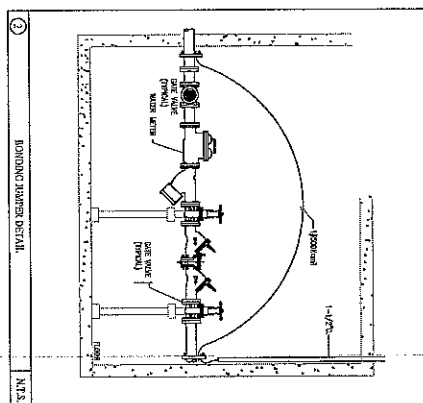
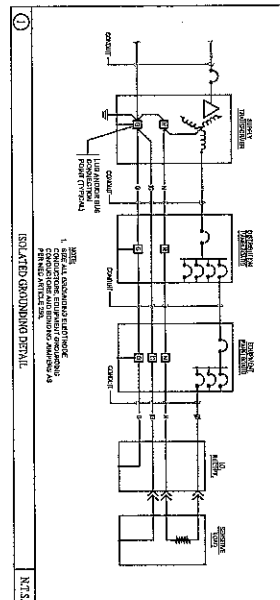
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**1. NORMAL POWER DISTRIBUTION**



**2. EMERGENCY POWER DISTRIBUTION**



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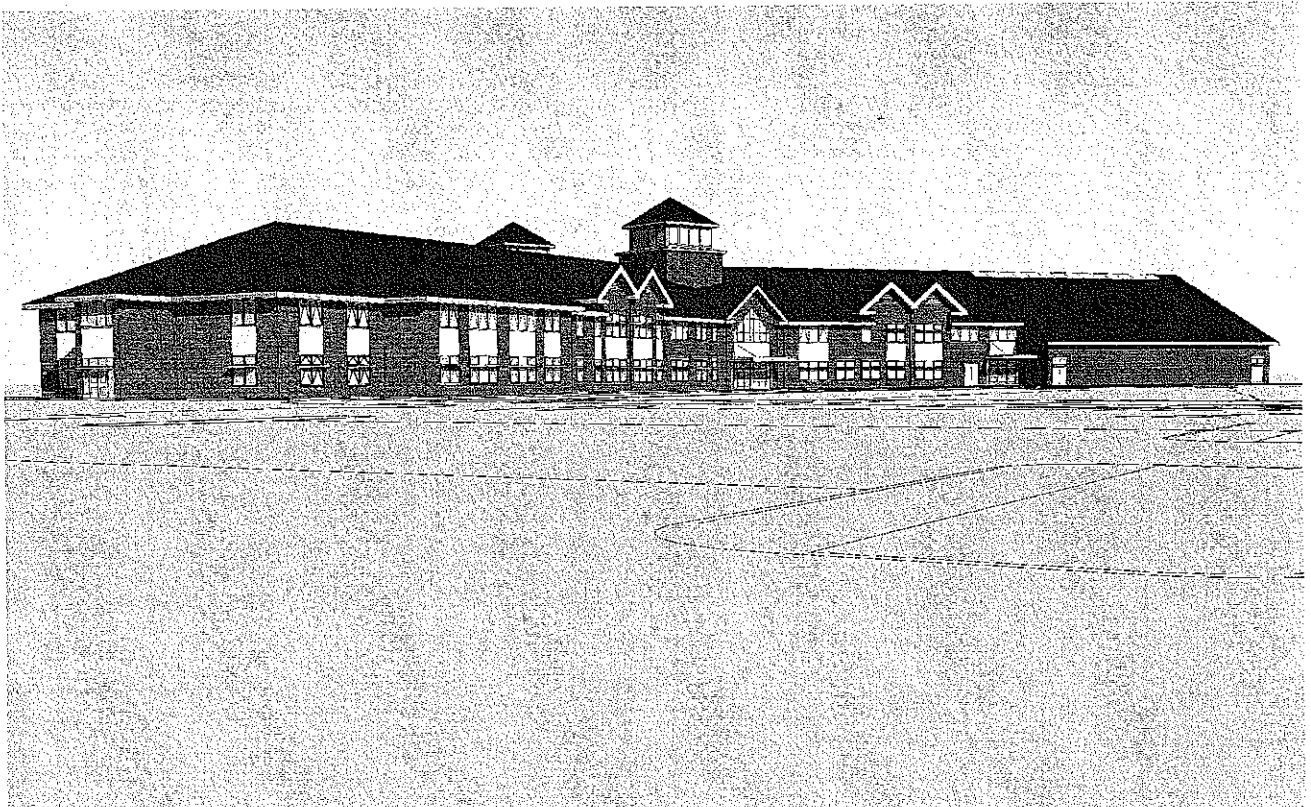
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8.1.11

## EXTERIOR VIEWS

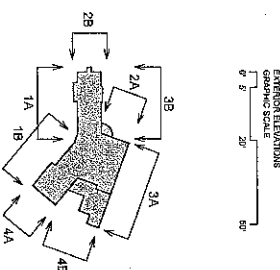
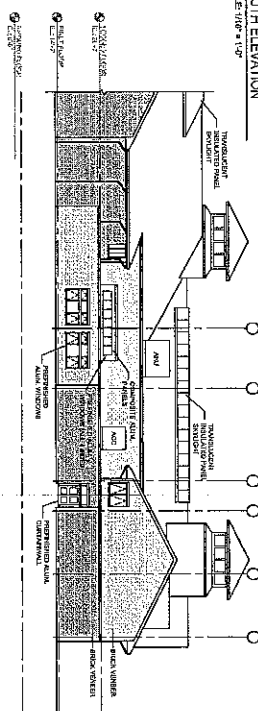
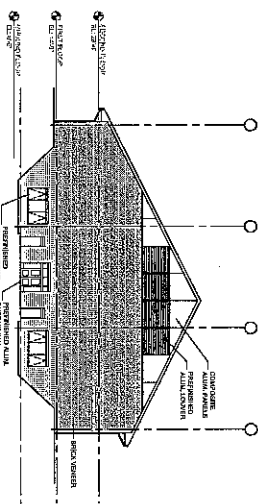
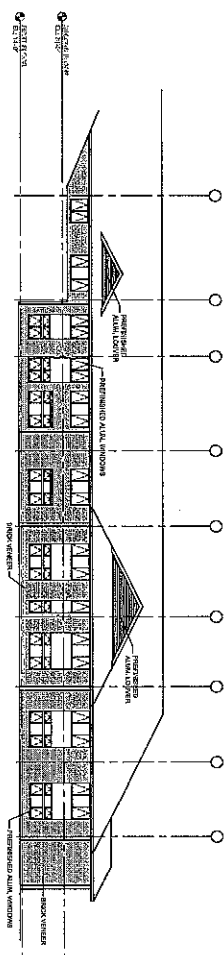
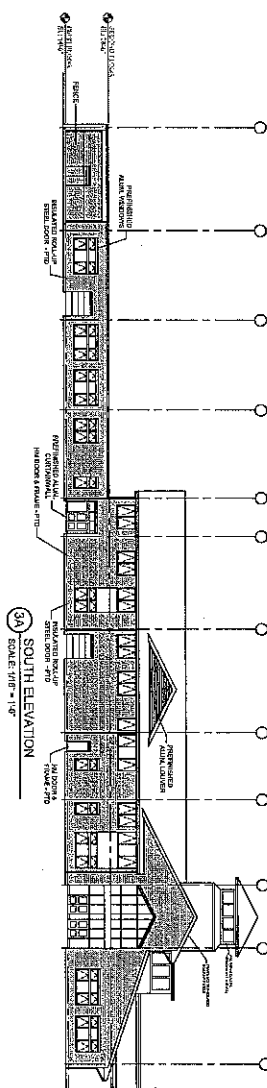
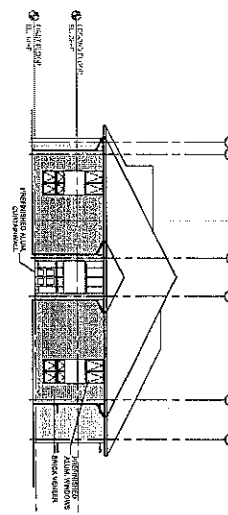
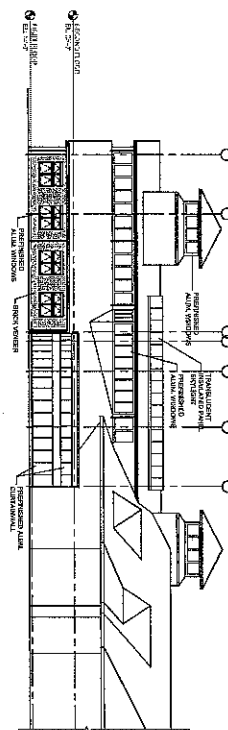
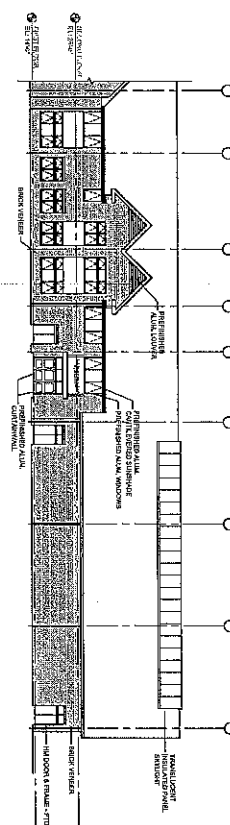
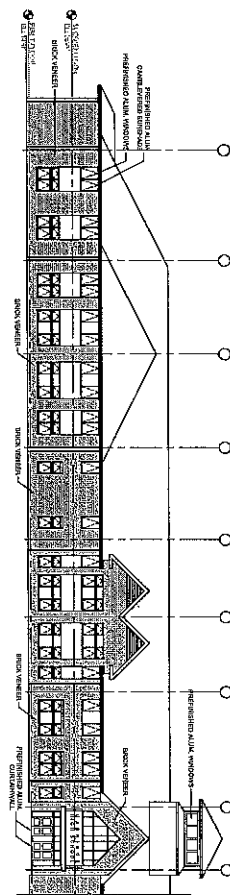
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VIEW FROM SOUTH WEST (FRONT)



VIEW FROM SOUTH WEST (FRONT)

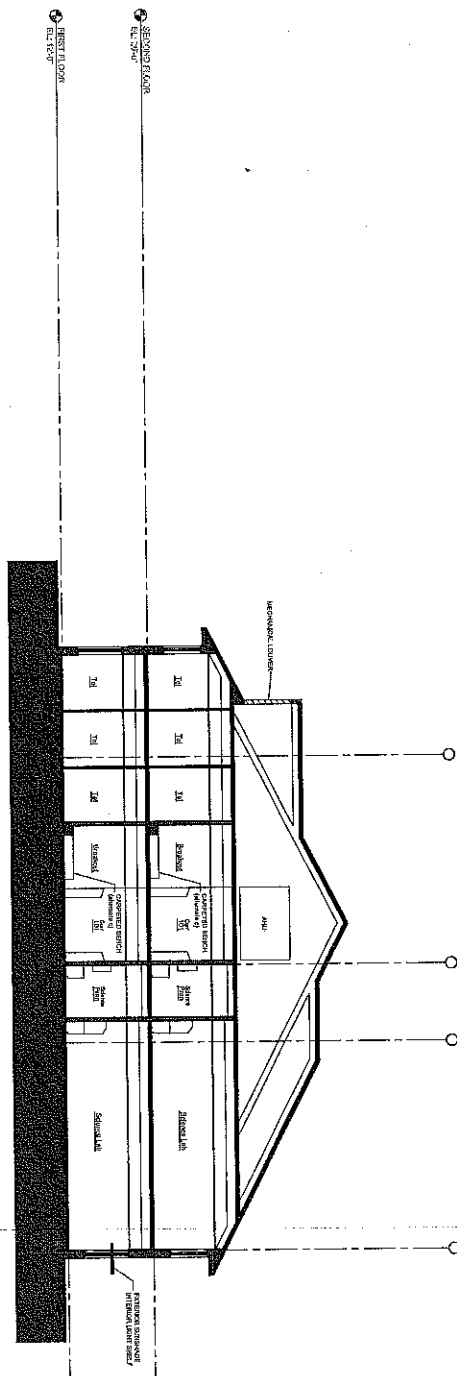
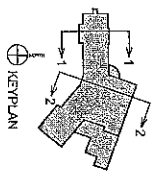


**Uxbridge High School**  
246 - 270 Quaker Highway Uxbridge Massachusetts 01569

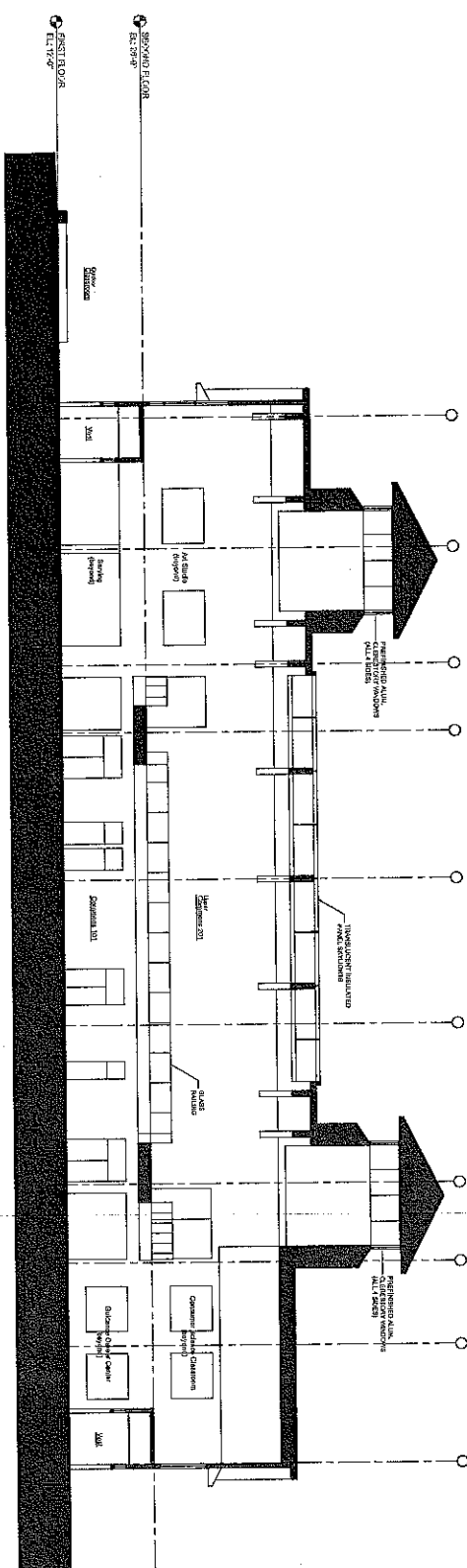
**BUILDING SECTIONS (alternate a)**

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A18

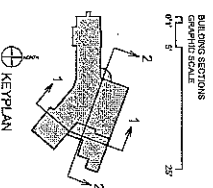
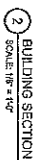


1 BUILDING SECTION  
SCALE: 1/8" = 1'-0"



**BUILDING SECTION**  
SCALE: 1/8" = 1'-0"

### BUILDING SECTIONS (alternate a)

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## TYPICAL WALL SECTIONS

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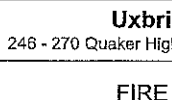


2DA

222 North Street  
Hingham, MA 02043

- [illegible]

## Uxbridge High School



1. **DESIGN** - INCLUDING DRAWINGS SHALL BE SUBMITTED FROM INITIAL DESIGN TO CONSTRUCTION OF SERVICE EXCEPT FOR SPARE AND PUMP ALARM SIGNAL SERVICE.
2. **SERVICES SHALL BE INSTALLED ON A COMMON VERTICAL CONDUIT WHEREVER POSSIBLE.**
3. **THE ALARM RINGS/ALERT SHALL BE LOCATED AT 6'-0" ABOVE THE SERVICE RACK TO BOTTOM OF STAIRS OR AT 6'-0" ABOVE THE TOP OF STAIRS, WHICHEVER IS LOWER, EXCEPT IS TO BE COMPARTMENT OF THE BUILDING FRONT OF THE BUILDING.**
4. **SERVICES SHALL BE INSTALLED ON A COMMON VERTICAL CONDUIT WHEREVER POSSIBLE.**
5. **ELECTRICAL CONDUITANCE SHALL CONDUIT WITH SUFFICIENT AND NOT LESS THAN 1/2" DIA. ALTHOUGH 3/4" DIA. IS PREFERRED IN ALL SERVICES ABOVE CONDUITS.**

FAO.1

- GENERAL NOTES**
1. REFER TO DRAWING SET FOR ALL SYMBOLS, ETC.
  2. FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODE 72, SECTION 16.10.1.1.
  3. THE FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODE 72, SECTION 16.10.1.1.



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**Uxbridge High School**  
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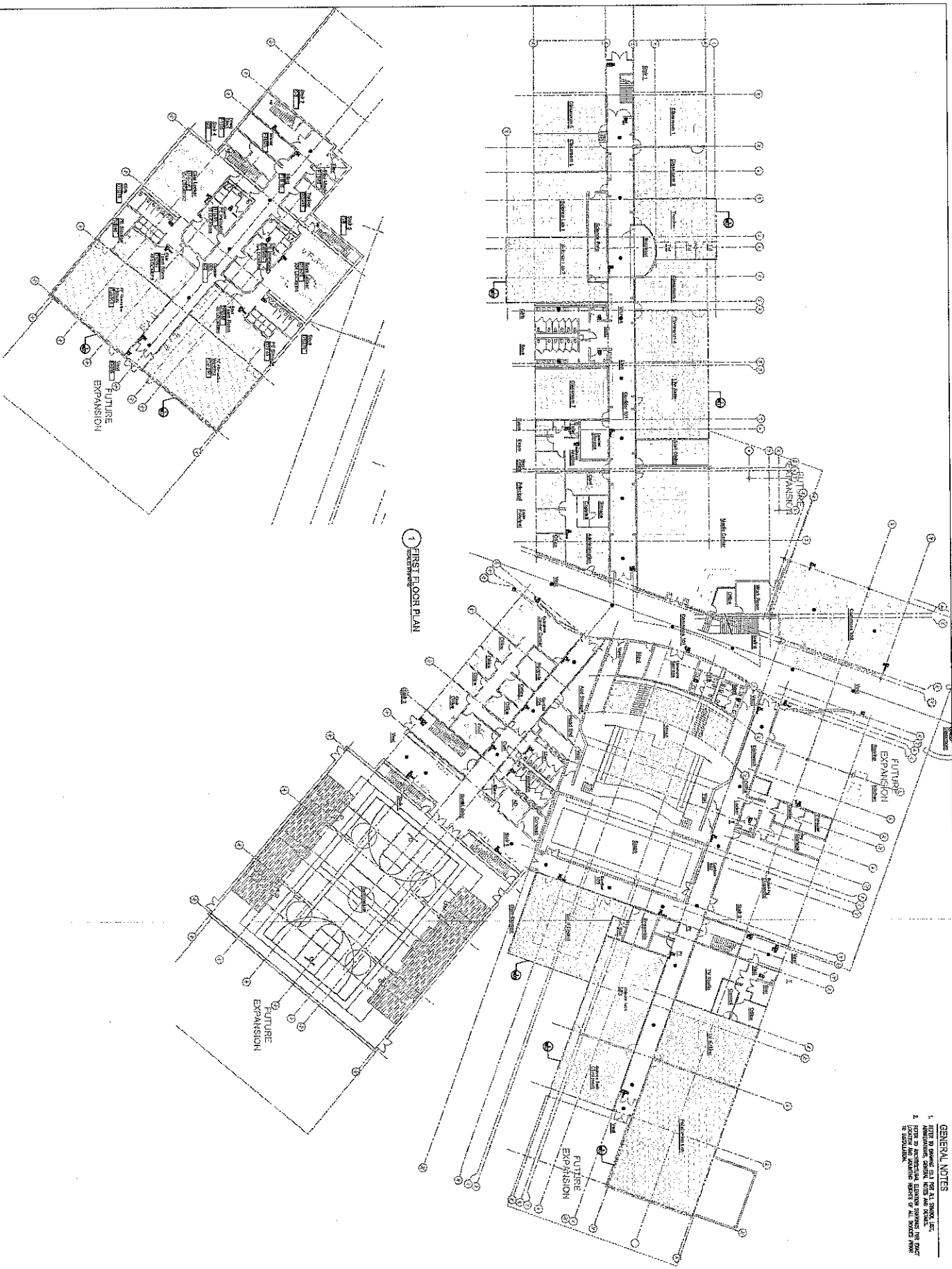
**FIRE ALARM FIRST FLOOR & GROUND FLOOR PLAN**

Revisions	
No.	Description
1	Issue for Review
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3	Issue for Review
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5	Issue for Review
6	Issue for Review
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**1 FIRST FLOOR PLAN**

**2 GROUND FLOOR PLAN**





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**SUMMARY CODE COMPLIANCE REPORT**

**UXBRIDGE HIGH SCHOOL**  
**246 – 270 QUAKER HIGHWAY**  
**UXBRIDGE, MASSACHUSETTS**

Prepared for: Raymond Design Associates, Inc.  
222 North Street  
Hingham, Massachusetts 02043

Prepared by: Luis F. Fernandez, PE  
Fernandez & Associates

Date: Revised June 11, 2010  
Original June 7, 2010

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**DISCLAIMER**

This report was prepared by Fernandez & Associates for Raymond Design Associates, Inc. The material in this report reflects Fernandez & Associates best engineering judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third party. Fernandez & Associates accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

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### EXECUTIVE SUMMARY

This report has been prepared in order to assist the design team in identifying the applicable codes for this project and in understanding the impact of these codes. By direction of our client this report is limited to issues involving building occupancy classification, building height and area limitations, fire resistive construction, egress and fire detection/suppression requirements.

We reviewed the drawings submitted to our office by Raymond Design Associates, Inc. dated May 21, 2010 we found some areas where the Massachusetts State Building Code requirements are not met. The areas where the deficiencies were noted are the following:

- As discussed, any Emergency Power Electrical Rooms need to have a 2 hour fire resistive construction with a 1.5 hour rated doors.
- As discussed, if a Fire Pump Room is needed it must have direct access to the outside or access through a 2 hour fire resistive construction corridor. In addition, the room construction is required to be a 2 hour fire resistive construction with a 1.5 hour rated doors.
- The Media Center door to corridor 101 needs to swing in the direction of egress as this is a required egress door for this area.
- The Stage needs to be provided with a 2 hour fire resistive construction wall/proscenium separating the seating area from the stage. The opening must be protected with a fire curtain or a deluge sprinkler system.
- The Stage also needs to be provided with smoke control or smoke/heat vents.
- The second floor Foreign Language Lab occupant load capacity is exceeded based on the room square footage and currently shown desk count.
- A second stairwell is needed from Corridor 201 as the stair capacity currently provided is not enough for the occupant load.
- As discussed, the two story open area is considered an atrium under the current Massachusetts State Building Code. It is our understanding that the 8<sup>th</sup> edition of the MSBC will allow the two-story area to not be considered an atrium, therefore eliminating the need for a smoke control system.

Based on the review, it is our opinion that the remainder of the building appears to comply with the Massachusetts State Building Code.



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## INTRODUCTION

### General

Fernandez & Associates has been retained to provide code support to Raymond Design Associates, Inc. with regard to the new proposed Uxbridge High School building project. The Uxbridge High School is located at 246 – 270 Quaker Highway in Uxbridge, Massachusetts. The project architect is Mr. Gene S. Raymond Jr., AIA, LEED AP. Mr. Luis F. Fernandez, PE is the project manager on this project for Fernandez & Associates.

### Codes Reviewed

The following codes are in effect in Massachusetts, or are nationally recognized standards, which have been reviewed for this project.

1. 780 CMR: Massachusetts State Building Code (MSBC), 7<sup>th</sup> edition.
2. 527 CMR: Massachusetts Fire Prevention Regulations.
3. 521 CMR: Massachusetts Architectural Access Board Regulations.
4. 524 CMR: Massachusetts Elevator Regulations.
5. National Fire Protection Association (NFPA) 13 “Standard for the Installation of Sprinkler Systems”, 2007 edition.
6. NFPA 72 “National Fire Alarm Code”, 2007 edition.

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## BUILDING DESCRIPTION

Based on the information provided to our office by Raymond Design Associates, Inc., the Uxbridge High School facility will consist of a two-story plus basement Type I-B construction building. The total square footage of the new building is approximately 123,861 square feet.

Given this information, the Massachusetts State Building Code classifies this occupancy as Educational Group E occupancy. The MSBC defines an Educational occupancy as building or structure used by six or more persons at any one time for educational purposes through the Twelfth grade. (780 CMR §305.1) Assembly areas (ie. gym and cafeteria) that are accessory to Group E occupancies are not considered separate occupancies. (780 CMR §302.2.1)

All educational occupancies are required to be accessible. (521 CMR §12.1)

### Construction Type Minimum Fire Resistance Requirements (780 CMR Table 601)

Building Elements	Type I-B Fire Resistance Rating (Hrs)	Opening Protectives (Hrs)
Structural Frame (including columns, girders, and trusses)	2 <sup>a</sup>	
Exterior Bearing Walls	2	
Interior Bearing Walls	2 <sup>a</sup>	
Exterior Non-Bearing Walls and partitions with less than 30 feet fire separation distance <sup>b</sup>	1	
Exterior Non-Bearing Walls and partitions with 30 feet or more fire separation distance	0	
Interior Non-Bearing Walls and Partitions	0	
Floor Construction (including support beams and joist)	2	
Roof Construction (including support beams and joist) less than 20 feet above floor below	1	
Roof Construction (including support beams and joist) 20 feet or more above floor below	0	
Exit Access Corridors (780 CMR Table 1016.1)	0	0
Stair Shafts (780 CMR §1019.1 & Table 715.3)	1	1
Mechanical & Elevator Shafts (780 CMR §707.4 & Table 715.3)	1	¾
Boiler Room (780 CMR Table 302.1.1)	1 <sup>c</sup>	¾
Storage Rooms Greater than 100 ft <sup>2</sup> in Area (780 CMR Table 302.1.1)	1 <sup>c</sup>	¾
Laboratories	1 <sup>c</sup>	¾

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- a. Fire resistance rating of structural frame and bearing walls are permitted to be reduced by one (1) hour where supporting only one (1) floor or roof above it.
- b. The fire resistance rating of exterior walls with a fire separation distance of greater than 5 feet should be rated for exposure to fire from the interior. Exterior walls with a fire separation distance 5 feet or less should be rated for exposure from both interior and exterior. (780 CMR §704.5)
- c. One (1) hour fire resistive construction or provide automatic fire extinguishing system with smoke partitions that extend from the floor to the underside of the fire resistance rated floor/ceiling assembly or fire resistance rated roof/ceiling assembly or to the underside of the floor or deck above. Doors shall be self-closing or automatic closing upon smoke detection and shall not have air transfer grills or openings with no gaskets, nor undercut clearances in excess of  $\frac{3}{4}$  inches.

Based on this information received at our office from Raymond Design Associates, Inc., the height and area limitations in the MSBC for this building construction are not exceeded under the current proposed scope.

### Interior Finish

#### Walls & Ceilings (780 CMR Table 803.5)

Use Group	E
Exit Stair	Class B
Exit Access Corridors	Class C
Room & Enclosed Spaces	Class C

### Floors

As the building is a fully sprinklered building, traditional floor coverings such as wood, vinyl, carpeting and other resilient floor coverings passing the DOC FF-1 pill test are allowed throughout the building, including all exits, exit passageways, exit access corridors. (780 CMR §804.5.1)

## **BARRIERS TO FIRE SPREAD**

This section identifies the barriers to be provided in order to limit fire spread. Fire and smoke will tend to spread from the compartment of fire origin in a vertical and horizontal manner. Limiting this spread is important to maximize the effectiveness of the fire suppression and egress systems. The following sections describe the general methods used.

### **Barriers to Vertical Spread**

#### **Stairwells**

Stairwells are required to be enclosed with one (1) hour noncombustible construction. (780 CMR §1019.1) Enclosures are required to be continuous to the exterior either directly or through an exit passageway.

Exterior walls that enclose stairwells are not generally required to have a rating other than the required rating for exterior walls per construction type. Where there are non-rated walls or unprotected openings from an interior stair to the exterior, any other portions of the building within ten feet horizontal distance exposed at an angle of less than 180 degrees are required to have openings protected with 3/4 hour opening protectives. (780 CMR §1019.1.4)

Openings into stairwells are limited to those required for exiting from normally occupied spaces, permitted exterior openings, and penetrations for utilities serving only the stair.

Doors are required to be one (1) hour rated and self closing with latches. (780 CMR Table 715.3)

#### **Mechanical Shafts**

Mechanical shafts are required to be enclosed by at least a one (1) hour construction. (780 CMR §707.4)

Ducts that penetrate the shaft are required to have smoke and fire dampers with at least a one and a half (1-1/2) hour rating for one (1) hour shafts. (780 CMR Table 716.3.1)

Ducts through walls and/or floor with a fire-resistance rating of one hour or less in a fully sprinklered building are not required to have fire dampers when the ducts are constructed of at least No. 26 galvanized sheet steel gage and are continuous from the HVAC system to the outlet and inlet terminals. (780 CMR §716.5.2 Exception #3, 780 CMR §716.6.3)

#### **Elevator Shafts**

Elevator shafts and elevator machine room are required to be enclosed by at least one (1) hour construction. (780 CMR §707.4)

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## Barriers to Horizontal Spread

### Corridor Walls

Corridor walls are not required to have a fire-resistive construction rating. (780 CMR Table 1016.1)

Doors from mechanical, storage and janitorial areas to a corridor are required to have a twenty (20) minute fire rating. Doors are not permitted to have louvers. Doors are required to be self-closing with latches. Gaskets are to be installed at the sides and top to provide a seal against the passage of smoke. (780 CMR §710.5 and Table 715.3)

### Permanent Partitions

Hazardous areas are required to be separated by a one (1) hour fire resistive construction wall or an automatic fire extinguishing system. (780 CMR §302.1.1)

### Stage Wall

The stage opening wall is considered an interior bearing wall requiring a two (2) hour construction. (780 CMR Table 601.0) A fire curtain or water curtain is not required as the stage height is less than 50 feet. (780 CMR §410.3)

## Fire Stopping

Penetrations through walls with a required fire resistance rating other than permanent partitions are required to have the appropriate through penetration fire stops or have the annular space filled with material which prevents the passage of smoke and hot gases.

Penetrations through floors are required to be protected with through penetration fire stops or to have the annular space filled with material which prevents the passage of smoke and hot gases.

## **MEANS OF EGRESS**

### **Introduction**

Once a fire is detected and the alarm is sounded, occupants must either be protected from the fire until it is controlled, or they must be removed from the building. Both methods are proposed for use in this building.

The egress system as proposed will be supported by means of passive fire protection systems such as fire resistive enclosures, and active systems, including extinguishing systems.

An egress system can be described in terms of three subsystems; the Exit Access, the Exit and the Exit Discharge. These subsystems form the means by which occupants are able to safely travel to the outside of the building.

Elements of a sound egress system include:

- Multiple independent directions of exit travel.
- Exit locations that may be easily reached by occupants.
- Protection of the occupants from the fire products during escape.
- Proper illumination and marking of the exit routes.

### **Occupancy**

The occupancy classification for the building the Massachusetts State Building Code is Educational Group E.

### **Occupant Load**

The occupant load of a building or portion of a building is determined based on the floor area and the use of the area. The table below provides the occupant load factors that are applicable to this project. Note that under the MSBC, the building official has a great degree of discretion with regard to areas not used simultaneously.

Rooms with more than 50 persons without fixed seats are required to have the maximum occupant load posted near the main exits from the room.

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### Occupant Load Factors (780 CMR Table 1004.1.2)

Area	Floor Area Per Occupant (ft <sup>2</sup> /occupant)
Classrooms	20 net
Offices	100 gross
Library	50 net
Library – Stacks	100 gross
Kitchen	200 gross
Storage and Mechanical Rooms	300 gross
Assembly/Gymnasium	7 net
Assembly/Cafeteria Sitting Area and Stage/platform	15 net
Laboratory and Vocational Classrooms	50 net
Locker Rooms	50 gross
Exercise Rooms	50 gross

## Exit Arrangement

### Introduction

The exit access subsystem consists of aisles, corridors or open spaces, and is the route leading to an exit. Exit access must be of sufficient width, unobstructed, discernible, arranged as described below, and lead to the proper number of exits.

### Minimum Of Two Means Of Egress Are Required Where Number Of Occupants Is At Least (708 CMR §1014)

Area	Occupant Load	Required Number of Exist	Number of Exits Provided
Classrooms	< 50	1	1
Offices	< 50	1	1
Library	>50	2	2
Library – Stacks	>50	2	2
Kitchen	< 50	1	1
Storage and Mechanical Rooms	< 50	1	1
Assembly/Gymnasium	>50	2	2
Assembly/Cafeteria Sitting Area and Stage/platform	>50	2	2
Laboratory and Vocational Classrooms	<50	1	1
Locker Rooms	<50	1	1
Exercise Rooms	<50	1	1

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### **Remoteness**

Where two exits are required, the exits are to be remote.

Where three or more exits are required, at least two are required to be remote. The remaining exits are required to be at a reasonable distance apart so that if one becomes blocked, the others will still be available.

Remote is defined as a distance apart at least equal to 1/3 the overall diagonal of the area or floor served for a fully sprinklered building. (780 CMR §1014.2.1 Exception #2 and §1014.2.2 Exception #1) The distance is measured in a straight line between the exits.

### **Corridors**

When two or more exits are required, the exits are required to be arranged so that it is possible to go in either direction from any point in a corridor except for dead ends.

Dead ends in corridors must be limited to less than 20 feet. (780 CMR §1016.3)

### **Travel Distance**

Travel distance is defined as the total length of travel from any occupied point on a floor to an exit. The exit access travel distance for this project is 250 feet. (780 CMR Table 1015.1)

### **Common Path of Egress Travel**

The common path of egress in Group E occupancies (ie classroom to corridor) must not exceed 75 feet. (780 CMR §1013.3)

### **Intervening Rooms**

Access to exits may occur through foyers, lobbies and reception rooms.

Egress from a room or space must not pass through an adjoining space or intervening rooms or areas, except where such areas are an accessory to the area served. Intervening rooms must not be closets, kitchens or other similar spaces. (780 CMR §1013.2)

## **Types of Exits**

### **Doors**

Door swing is required to be in the direction of exit travel when serving a hazardous area or an occupant load of 50 or more. (780 CMR §1008.1.2)



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Required exterior doors are required to swing in the direction of egress.

Doors in required exits are required to open from the inside without any special knowledge of effort. Key locks are not permitted from the inside. Doors must be equipped with panic hardware. (780 CMR §1008.1.3.4)

Landing or floors are required on each side of a door. (780 CMR §1008.1.4)

Landing or floors at doorways that are required to be accessible are not permitted to be greater than 1/2" below the threshold of the doorway. (780 CMR §1008.1.4)

Exit doors are required to be readily distinguishable from the surrounding construction. (780 CMR §1008.1)

Glass doors are permitted to be constructed of safety glazing.

### **Corridors**

Corridors are permitted to be considered part of the means of egress.

### **Folding/Movable or Portable Partitions**

The location of these types of partitions is required to be restricted by permanent tracks, guides or other approved means.

### **Stairs**

Handrails are required on both sides of stairs. (780 CMR §1009.11)

### **Ramps**

Changes in elevation of less than 12 inches in an exit serving ten or more occupants are required to be accommodated by ramps.

Handrails are required on both sides of all ramps with a rise greater than six (6) inches. (780 CMR §1010.8)

### **Exit Discharge**

All exits are required to lead to the exterior of the building. (780 CMR §1023.1)

The exit discharge must be to grade or it must provide direct access to grade. The exit discharge must not reenter the exit access.

Acceptable manufacturers, or approved equal:

- Levolar Corporation, Sunnyvale CA.
- Mecho Shade, Long Island City, NY.
- Draper Shade and Screen, Inc, Spiceland, IND
- Vimco, Richmond VA

**C20 INTERIOR FINISHES**

**C2010 WALL FINISHES**

**C2010.01 Wood wainscot:**

Wood Wainscot: Custom Fabricated under Architectural Woodwork, conforming to AWI Premium Grade Quality Standards, with Red Oak, Quarter Sawn with shop applied transparent finish.

**C2010.02 Ceramic tile wall finish:**

Interior wall tile: Glazed ceramic wall tile: Standard grade glazed ceramic tile, conforming to ANSI A137.1, nominal 4-1/2 by 4-1/2 inch by 5/16 inch thick, thin set mounted over 1/2-inch thick glass fiber reinforced Cementitious backing board. Fabric panel assembly tested in accordance with ASTM E 84 with gypsum wall board substrate, is UL rated Class A.

**C2010.03 Acoustical wall finishes:**

Gymnasium: 2 inch thick, Wood Fiber tongue and groove acoustical wall panels. Acceptable products include:

- Tectum Inc., Newark OH., product "Tectum wall panels".
- Martin Acoustical Products, Bogart GA, product "AcoustiPlank" acoustical wall panels.

Café, Auditorium, Music Classroom and Music Practice Rooms: Back mounted, fabric wrapped acoustical wall panels with impact-resistant face. Factory pre-fabricated 1 inch thick fabric covered panels (identified by Keynote 09841.20) with 1/2 inch radius bullnose edge at perimeter of panels and square edge at butt joints.

- Cores: 1 inch thick tackable 7 lb./ft.<sup>3</sup> density rigid fiberglass core board with woven fiberglass scrim face and chemically hardened edges.
- Mounting System: Concealed Z-clips and wall mounting clips, recessed into panel to allow back of panel to lie flush with wall surface.

**C2010.04 Fiberglass Reinforced Plastic Covered Panels (FRP) at Food Service Areas, Janitor's closets:**

USDA approved rated and non-rated glass fiber reinforced plastic panels, UL Class "A" rated, complete with installation adhesive, non-corroding fasteners, vinyl moldings, and all other components.

Acceptable manufacturers, or approved equal:

- Kemlite Company (division of Crane Company), Joliet IL., (Glasbord Products).
- Nudo Products, Inc., Springfield, IL. (Fiber-Lite Products).

**C2010.05 Painted finishes includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials specified herein, whether used as prime, intermediate or finish coats.**

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### Interior Paint requirements regarding volatile chemicals (VOC's):

- Flat Paints and Coatings: VOC not more than 50 g/L.
- Non-Flat Paints and Coatings: VOC not more than 150 g/L.
- Anti-Corrosive Coatings: VOC not more than 250 g/L.
- Clear wood finishes, varnishes: VOC not more than 350 g/L.
- Clear wood finishes, lacquer: VOC not more than 550 g/L.
- Clear wood finishes, floor coatings: VOC not more than 100 g/L.
- Sealers, waterproofing sealers: VOC not more than 250 g/L.
- Sealers, sanding sealers: VOC not more than 275 g/L.
- Sealers, all other sealers: VOC not more than 200 g/L.
- Stains: VOC not more than 250 g/L.

### Interior Paint Schedule:

- Interior concrete masonry walls and partitions:  
One coat block filler:  
Two coats water-based epoxy at gymnasium, showers, corridors, stairwells and all ground floor partitions, , or Two coats acrylic semi-gloss paint where epoxy is not required.
- Interior Exposed Ductwork, Insulated and Wrapped: Apply one prime coat and two finish coats of a paint recommended by the approved paint manufacturer for application on the exposed wrapping material.
- Interior gypsum board (drywall) partitions, new:  
One coat latex primer.  
Two coats latex eggshell paint:
- Interior gypsum board (drywall) ceilings, and underside of soffits, new:  
One coat latex primer.  
Two coats latex flat paint:
- Interior gypsum board (drywall) partitions, and ceilings, at kitchen, toilet rooms, janitor's closets, and locker rooms for epoxy finish:  
One coat of sealer.  
Two coats of semi-gloss Water Based Acrylic-Epoxy Coatings (3 mils DFT each coat).
- Interior ferrous metals, excluding railings:  
- gloss finish: (includes galvanized metal doors and frames):  
One coat of rust prohibitive direct to metal primer for unfinished metal surfaces, and touch up bare metal at shop primed surfaces:  
Two coats of semi-gloss 100% acrylic enamel paint.
- Interior galvanized metals, (includes exposed ductwork):  
Touch-up with direct to metal primer.  
Two coats of semi-gloss 100% acrylic enamel paint.
- Interior exposed metal, piping: Same as specified for ferrous metal.
- Interior metal, Railings, (handrails and guardrails) to receive aliphatic acrylic polyurethane finish:  
First coat, epoxy undercoat:  
Second coat, high gloss aliphatic acrylic polyurethane coating:
- Interior wood trim, new, unfinished, to receive painted (opaque) finish:  
One coat alkyd enamel primer-sealer (undercoater):  
Two coats acrylic semi-gloss enamel:
- Interior wood trim, unfinished, to receive clear polyurethane (water-based) finish.  
One coat paste wood filler for open-grained woods.  
Two coats of satin-gloss (low luster) finish clear water-based polyurethane

- Plywood backboards for electrical panels and other equipment. Paint both front and back surfaces and all edges of plywood backboards before backboards are installed.  
One coat latex enamel primer-sealer (undercoater).  
Two coats of gloss latex enamel paint.
- Interior recycled water piping, Insulated and Wrapped to receive  
- semi-gloss finish including concealed locations.  
Sequencing: all recycled water piping must be painted prior to being concealed by work of other trades.  
Paints:  
At non insulated conditions: Same as specified for ferrous metal.  
At insulated conditions: Apply one prime coat and two finish coats of a paint recommended by the approved paint manufacturer for application on the exposed wrapping material.  
Color: As required by Massachusetts State Plumbing Code.
- Prime and paint insulated and exposed cold pipes, conduit, electrical boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are located in storage, mechanical or equipment spaces or those items which are factory prefinished.
- Exposed to view un-insulated hot pipes within finished painted areas: Two coats heat-resistant enamel conforming to Federal Specification TT-E-496, Type I, applied when surfaces are less than 140 degrees Fahrenheit.

Acceptable manufacturers, or approved equal:

- Benjamin Moore & Company, Montvale, NJ.
- California Paints, Andover MA.
- ICI – Devco Paints, Louisville, KY
- Pittsburgh Paints / PPG Industries, Inc., Pittsburgh PA.
- Pratt & Lambert Inc., Buffalo, NY.
- Sherwin Williams, Cleveland OH.

## C2030 FLOORING

### C2030.01 Sealed Concrete Finish:

Concrete sealers/coatings on all exposed-to-view concrete floors (includes entire ground floor except weight and fitness rooms). Transparent single component water-based high solids acrylic sealer and dustproofer having a minimum of 27 percent non-yellowing styrene-acrylic copolymer solids, and Fugitive Dye, complying with ASTM C309 type 1D.

### C2030.02 Ceramic Tile Flooring (Toilet rooms and locker areas):

Ceramic mosaic tile: Standard Grade unglazed ceramic mosaic tile, conforming to ANSI A137.1, nominal 2 x 2 inch by 1/4 inch thick, porcelain body, cushion-edges. Floor tiles shall be non-slip, containing not less than 7-1/2% by weight of silicone carbide or other rustproof abrasive of equal hardness. Thinset over concrete slabs.

- Waterproofing required at all suspended slabs.
- Floor Accent tile: In Pattern determined by Architect not exceeding 5 percent of floor area.

### C2030.03 Resinous Flooring (Kitchen and Food Service Areas):

Broadcast Seamless Urethane Flooring System consisting of sloping epoxy mortar, flexible epoxy waterproofing membrane and troweled seamless epoxy topcoat.

- Troweled Base Coat: equal to Dex-o-Tex "Dex-O-Coat Industrial Floor".

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- Waterproofing Membrane: equal to Dex-o-Tex "Cheminert SC Membrane",
- Troweled seamless epoxy topcoat: equal to Dex-o-Tex "Decor-Flor".

Acceptable manufacturers, or approved equal:

- Crossfield Products Corp. (Dex-o-Tex), Roselle Park, NJ.
- Dur-a-flex Inc, East Hartford CT.
- Stonhard Inc, Maple Shade, NJ.

### C2030.04 Porcelain Tile Flooring: ('Commons' from front door to Café Eatery.):

Paver flooring tile: nominal 12 by 12 by 5/16 inch thick, 8 by 8 inch by 5/16 inch thick and 4 by 4 inch by 5/16 inch thick as indicated on the Drawings, un-glazed porcelain body, cushion-edges, in colors and finishes as selected by the Architect, medium set over concrete slabs with hydraulic mortar.

- Special patterns: Provide patterns with special accent color tile as indicated on Drawings.
- Base trim: single bullnose edged tile, nominal 4 by 8 inches by 5/16 inch thickness matching field tile.

Grout: component epoxy grout, conforming to ANSI 118.3 and ASTM C658.

### C2030.05 Resilient Flooring:

Resilient Base: Coved resilient base at resilient flooring and Straight (un-coved) resilient base at carpeted areas. Rubber Base, 4 inches high, coved or straight, ribbed back, 1/8 inch thick, rounded top, complying with ASTM F-1861, Type TP, Thermoplastic Rubber (TBR). Colors shall be as selected. Rubber base shall be furnished in continuous lengths, approximately 100 feet long.

- Base accessories: Premolded end stops of same material, size and color as base. Job-form all external and internal corners from base material, pre-molded corner pieces will not be acceptable.

Vinyl composition tile flooring: PVC-free, zero VOC 12 x 12 inch by 0.080 to 0.125 inch thickness with pattern and color extending through thickness of tile; composed of non-asbestos inorganic mineral fillers, and colorfast pigments complying with ASTM F1066 Class 2, Colors shall be as selected by the Architect from manufacturer's full available range.

Acceptable products, or approved equal:

- Armstrong World Industries, Inc., product "BioBased Migrations".
- American Biltrite, product "Stonescape PCT".
- The Mohawk Group, product "StoneWalk".

### C2030.06 Rubber Flooring:

Hammered finish sheet rubber stair treads/risers and compatible flooring at landings. Rubber flooring tile, hammered texture surface design, 2.7 mm (0.11 inches) overall thickness.

Acceptable flooring products, or approved equal:

- Freudenberg Building Systems Inc., Lawrence MA.; product Norament 825 C, Article 1910. Tile size: nominal 19-5/8 by 19-5/8 inches square (actual 50 cm by 50 cm).
- Endura Rubber Flooring, Waltham MA; product "Sculptured Profile Tile". Tile size: nominal 18-1/8 by 18-1/8 inches square (actual 46 cm by 46 cm).

- Roppe Products Company: product 993 "Textured Design" tile. Tile size: nominal 19-5/8 by 19-5/8 inches square (actual 50 cm by 50 cm).

C2030.07 Wood Strip Flooring (at Auditorium Stage): Cushioned stage flooring system with plywood underlayment, having oak strip flooring at Proscenium/apron, and resilient pads.

Proscenium/apron, oak strip flooring: Nominal 3/4 inch (25/32 inch) thick by 2-1/4 inches wide kiln-dried quarter sawn Red Oak (*Quercus Rubra*), NOFMA grade-marked Select and better, tongue and grooved and end-matched, installed over: CD-EXT-APA, 5/8-inch thick.

Stage Deck: Plywood flooring (two layers): Fir or southern pine plywood, Exposure 1 APA RATED SHEATHING 3/4 inch thickness, touch-sanded with cap sheet of 1/4 inch thick oil tempered, both sides "Signature S2S Hardboard Panel" by Decorative Panels International, or approved equal.

- Vapor Barrier: 6 mil polyethylene.
- Resilient pads: minimum 7/16 inch thick double-profile, cavity backed EPDM rubber with reverse cavity having non-coextensive lower and upper surfaces.
- Sleepers: Kiln dried Fir or Pine, nominal 2 inch by 3 inch.

C2030.08 Carpeting (roll goods):

Carpeting: Carpeting directly adhered over floors, where indicated on the Drawings, including all accessories necessary to complete the work.

General requirements: Carpet, shall conform with or pass tests of the following Standards:

- CRI – Green Label Plus
- ASTM D-2859 (Methenamine Reagent Pill Test).
- ASTM E-648 (Flooring Radiant Panel Test): Class I (Minimum Average CRF of 0.48).
- NBS Smoke Chamber Test: Maximum average of 450.
- AATCC-134 (Electrostatic Propensity): Maximum electrostatic generation below level of human sensitivity

Carpet Criteria

Construction	Patterned loop
Gauge	1/12
Pile units per Inch:	6.9
Tuft Density:	82.8 tufts per square inch
Pile Height:	0.187 inches
Pile Yarn Weight:	22 ounces per square yard
Density Factor	9,209 oz per cubic yard
Roll Width:	6 feet
Color:	As selected by Architect.
Fiber system:	45% Antron Legacy, 40% DuPont DSDN, 15% Antron Lumena Nylon 6,6
Dye Method:	Solution/Yarn dyed
Static Control:	tested 3.0 kv. or less at 20 percent relative humidity.

C2030.09 Carpet tile:

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Carpet tile: Carpet tile directly adhered over floors, where indicated on the Drawings, including all accessories necessary to complete the work.

General requirements: Carpet, shall conform with or pass tests of the following Standards:

- CRI – Green Label Plus
- ASTM D-2859 (Methenamine Reagent Pill Test).
- ASTM E-648 (Flooring Radiant Panel Test): Class I (Minimum Average CRF of 0.48).
- NBS Smoke Chamber Test: Maximum average of 450.
- AATCC-134 (Electrostatic Propensity): Maximum electrostatic generation below level of human sensitivity

Carpet Criteria: modular carpet, size 24 by 24 inches, having a total height of 0.268 inches with a pile height of 0.085 inches with a face weight of 18 ounces per square yard.

- Surface Texture – Pattern Loop
- Face Yarn – “Nylon6”
- Dye System – 85% solution dyed, 14% yarn died
- Fiber Technology - Duracolor® by LEES Stain Resistant System
- Backing Material – Polyolefin composite.
- Tile shall be 100% recyclable.
- Recycled content (by weight):
  - Pre-consumer: 28 percent
  - Post-consumer: 12.5 percent.

### C2030.10 Athletic Wood Flooring (at Gymnasium):

Provide full wood athletic flooring system, including finished floor and related substrate materials, equal to Robbins, Inc., Wausau, WI.: product “Bio-Channel Star”, or approved equal.

- Flooring channels consisting of a 1-1/2 by 2-5/8 inch by 8'-0" wood engineered wood sleeper with EPDM cushion attached, factory encased in a steel channel.
- Subflooring (one layer): Fir or southern pine plywood, Exposure 1 APA RATED CD SHEATHING 23/32 inch (18 mm) thickness, touch-sanded.
- Flooring: Nominal 3/4 inch (25/32 inch) thick by 2-1/4 inches wide kiln-dried plain sawn Northern Hard Maple (Acer Saccharum), MFMA grade-marked, tongue and grooved, and delivered to the project in bundles bearing the specified grade marking.
- School Logo: Center court 3 color (white, orange, black) custom school logo.

Acceptable manufacturers, or approved equal:

- Action Floor Systems, Inc., Mercer WI.
- Robbins, Inc., Wausau, WI.
- Superior Floor Company, Inc, Wausau WI.

### C2030.11 Athletic Wood Flooring (at Fitness Room):

Provide full wood athletic flooring system, including finished floor and related substrate materials, equal to Robbins, Inc., Wausau, WI.: product “Bio-Channel Star”, or approved equal.

- Flooring channels consisting of a 1-1/2 by 2-5/8 inch by 8'-0" wood engineered wood sleeper with EPDM cushion attached, factory encased in a steel channel.
- Subflooring (one layer): Fir or southern pine plywood, Exposure 1 APA RATED CD SHEATHING 23/32 inch (18 mm) thickness, touch-sanded.

- Flooring: Nominal 3/4 inch (25/32 inch) thick by 2-1/4 inches wide kiln-dried plain sawn Northern Hard Maple (*Acer Saccharum*), MFMA grade-marked, tongue and grooved, and delivered to the project in bundles bearing the specified grade marking.

Acceptable manufacturers, or approved equal:

- Action Floor Systems, Inc., Mercer WI.
- Robbins, Inc., Wausau, WI.
- Superior Floor Company, Inc, Wausau WI.

**C2030.12 Athletic Rubber Flooring (at Weight Room):**

Resilient athletic 3/8 inch thick rubber flooring tile, 27 by 27 inches square with transition strips wherever edges of flooring materials abut dissimilar flooring. Equal to Tuflex product, "Spartus".

Acceptable manufacturers, or approved equal:

- Robbins, Inc., Wausau, WI.
- Tuflex Rubber Products Inc., Tampa FL

**C2030.13 Recessed Aluminum Foot Grille:**

Foot grille shall be constructed from 40% post-industrial recycled aluminum alloy type 6061-T6, fabricated to sizes indicated on the Drawings with mechanically fastened rails (swedge or key lock fastening of rails is not acceptable) equal to Mats, Inc. "Safe Track" grille.

Tread: T-shaped blades; 3/8 by 1/8 by 1 inch size; spacing between blades not to exceed 3/16 inch.

Recessed Frame: Frames shall be a "Z" shape equal to model "TT" by Mats Inc, anchoring the foot grille structure into concrete. All aluminum frames shall be pre-assembled at factory incorporating welded construction for all joints with mitred corners. Multiple grille sections shall incorporate an invisible section divider integrated and welded within the frame.

**C2030.14 Entry Floor tile:**

Entrance Floor Mats and Frames with sub-floor filler: 3/8 inch thick rolled entry matting, "Berber" design, all weather nob-styled UV stabilized solution dyed polypropylene carpet having a face weight of 50 ounces per square yard, with solid synthetic rubber backing.

Acceptable manufacturers, or approved equal:

- Mats, Inc., Stoughton, MA.
- Tek Stil Concepts Inc., Haddonfield NJ.
- Arden Architectural Specialties, Inc., St. Paul MN.
- Balco Inc., Wichita KS.

**C2050 CEILINGS**

**C2050.01 General ceilings:**

Suspended acoustical tile ceiling(s) (ACT) including suspension system(s) and associated edge moldings. Nominal 24 by 24 inch by 3/4 inch thick panel with angled tegular (reveal) edge in



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manufacturer's white color having a minimum light reflectance of LR 0.83 and a NRC range of 0.60 to 0.65.

- Description: ASTM E-1264 Type III, Form 1 or 2, Pattern E; Class A flame spread, wet formed mineral fiber fine textured panel, non-combustible, vinyl latex paint finish. Minimum recycled content: 82 percent recycled content (54 percent post-industrial and 29 percent post-consumer).

Acceptable products, or approved equal:

- Armstrong product "Cirrus Tegular Edge" product number 534, with HumiGuard Plus.
- Celotex product "Cashmere" with Reveal edge, product number CM-454.
- USG product "Eclipse ClimaPlus" with SLT edge, product number 76775

### C2050.02 Food Service and Wet Area Ceilings:

Suspended acoustical tile ceiling(s) (ACT) including suspension system(s) and associated edge moldings. Nominal 24 by 24 inch by 5/8 inch thick panel with angled tegular (reveal) edge in manufacturer's white color having a minimum light reflectance of LR 0.79 and a CAC range of 35 to 39.

- Description: ASTM E-1264, UL Fire Resistance Labeled panel, non-combustible mineral fiber board with non-directional non-perforated impervious white vinyl membrane face.

Acceptable products, or approved equal:

- Armstrong product "Clean Room VL HumiGuard Plus; non perforated" product number 868 (Pattern E).
- Celotex product "Vinyl Guard" product number VG-157.
- USG product "Clean Room Class100", product number 56099.

### C2050.03 Toilet Rooms, Physical Education Offices, Fitness and Weight Room:

Suspended wood fiber tile ceilings, including suspension system(s) and associated edge moldings. Nominal 24 by 24 inch by 1-1/2 inch thick with square edges.

- Description: ASTM E-1264 Type XIV pattern L Class A having a NRC of 0.50 and a minimum light reflectance of LR 0.75 factory painted white.

Acceptable products, or approved equal:

- Tectum product "Acousti-Tough Ceiling System.

### C2050.04 Locker Rooms, Team rooms, Gymnasium and Service Spaces: Two coats waterborne acrylic dry fall finish applied over exposed structural deck or concrete as applicable.

Acceptable products, or approved equal:

- California: "Economy Latex Dry Fall Spray Flat", N°. 3701.
- ICI Paints: "Spraymaster-Pro Unigrip" N°. 1280 WB Flat Acrylic Dryfall.
- Moore: "Sweep-Up Spray Latex Flat", M53 Series.
- Pittsburgh: "Speedhide Latex Dry Fog Spray Paint", 6-714/715 Series.
- Sherwin-Williams: "Super-Save-Lite H-Tec Dryfall".

### C2050.05 Auditorium, suspended acoustical (reflector) clouds:

### C2050.06 Light Reflector shelves:

Shop fabricated suspended aluminum shelves for light refraction at South-facing teaching spaces and administrative offices. Fabricate from roll-formed aluminum, 24 inches deep and suspended with cables to wall or overhead structure at 24 inches on center.

C2090 INTERIOR FINISH SCHEDULE

Refer to Drawings.

D SERVICES

D10 CONVEYING

D1010 VERTICAL CONVEYING SYSTEMS

D1010.01 Elevators

Furnish and install one holeless hydraulic 3-stop Commercial, 3500 pound capacity standard pre-engineered hydraulic passenger elevator. Work includes:

- Elevator car enclosure, hoistway entrances and signal equipment.
- Jacks.
- Operation and control systems.
- Accessibility provisions for physically disabled persons per ANSI A117.1, 1998.
- Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
- All other devices, materials and accessories for operation, dispatching, safety, security, leveling, and alarms, as required to complete the elevator installation.
- Elevator car shall be min. 54 inches by 68 inches measured wall-to-wall.
- Elevator hoist way doors and frames shall be stainless steel.
- Car shall have 2 single speed side opening doors.

Elevator cab floor shall have rubber flooring to match stair, specified in Division 9.

Load (rated capacity):	3,500 pounds.
Car Speed:	150 feet per minute.
Rise:	As indicated on Drawings
Number of Stops:	3
Landings:	Ground 1, & 2.
Height under car top:	8'-0"
Height under ceiling:	7'-6".
Platform dimension:	7'-0" wide by 6'-9" deep.
Clear car inside:	5'-8" wide by 4'-3" deep.
Car door type:	Single speed side opening.
Hoistway entrance:	3'-6" wide by 7'-0" high.
Motor:	40 horsepower minimum

D20 PLUMBING

D2010 PLUMBING FIXTURES

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### D2010.01 Water Closets

Water Closet: Wall hung vitreous china, siphon jet action, elongated bowl, exposed chrome plated battery operated sensor flush valve of the dual flush design, open front seat less cover (solid plastic), stainless steel check hinge, carrier to suit installation. 1.28 gallons per flush.

Water Closet, Accessible: Same as standard water closet above, except mounted at handicapped height.

### D2010.02 Urinals

Urinal: Wall hung, vitreous china, siphon jet action, exposed chrome plated battery operated sensor flush valve, 1/8 gallon per flush, carrier to suit installation.

Urinal, Accessible: Same as standard urinal except mounted at accessible height.

### D2010.03 Lavatories

Counter Lavatory, Counter Mounted: Undermount stainless steel bowl for installation with solid surface counter. Battery operated sensor faucet with integral temperature selection control 0.5 GPM flow control. Flat grid drain. Chrome plated supplies and P-trap.

Wall Hung Lavatory: Vitreous china, wall hung lavatory with faucet ledge for 8" centers, overflow, 20" x 18" size. Battery operated sensor faucet with integral temperature selection control and flat grid drain assembly, 0.5 GPM flow control. Chair carrier to suit installation. Chrome plated supplies and P-trap and escutcheons. Mounted at accessible height.

Public toilet rooms equipped with floor drains shall have hose bibs for house keeping purposes.

### D2010.04 Sinks

Counter Mounted Sinks: Self-rimming, 18 gauge, Type 304 stainless steel sinks, size as required by location. Gooseneck faucet with blade handles and flat grid drain, 1.6 GPM flow control. Chrome plated supplies and P-trap.

### D2010.05 Showers

Showers: Single lever control, pressure balanced mixing valve supplying an adjustable shower head with flow control fitting limiting flow to 1.9 GPM. Provide a floor drain in conjunction with each shower location.

Accessible showers: Single lever control, pressure balanced mixing valve, lever diverter, adjustable shower head, hand spray with flexible hose and slide bar, vacuum breaker. Provide a floor drain in conjunction with each shower location.

### D2010.06 Drinking Fountains and Coolers

Accessible Electric Water Cooler: Bi-level, lead free; all stainless steel basin and panel, ADA pushbutton or bar controls, rated for 8 GPH of 50° water.

### D2010.07 Other Fixtures

Mop Receptor: 36" x 24" x 10" deep white molded stone mop receptor with 3" integral stainless steel drain. Faucet to be provided with vacuum breaker, loose key stops and hose end.

Freeze proof wall hydrants shall be installed on the building perimeter at locations appropriate for washdown and watering/irrigation purposes.

D2020 DOMESTIC WATER DISTRIBUTION

D2020.01 Water Supply System

The new water supply system will connect to the Uxbridge City Water system. The service will be equipped with water meter and duplex pressure reducing stations and backflow preventers as required. The plumbing scope for the service shall begin inside the foundation wall.

D2020.02 Cold and Hot Water Systems:

Hot and cold water will be supplied to the toilet rooms and other fixtures, equipment, and locations in the building requiring water.

Potable hot water shall be generated utilizing a direct gas fired, high efficiency storage water heater sized to meet the system demand. Water shall be heated and stored at 140°F and then reduced to 120 via a thermostatic mixing valve for distribution to the fixtures. The kitchen will be supplied with hot water at 140°F.

Hot water shall be recirculated to maintain uniform temperature throughout the piping system.

Science laboratories shall be supplied with non-potable/protected cold and hot water systems. These systems shall include dedicated piping systems that utilize the base buildings cold and hot water systems as the source of supply. Reduced pressure backflow preventers shall be installed on the supply piping to create the dedicated protected systems.

The non-potable/protected hot water system shall be provided with electric heat trace for temperature maintenance.

All Science labs shall be provided with emergency deluge showers and eye-face wash fixtures. These fixtures shall be supplied with tempered 80-90 degree F potable water that shall have its temperature regulated by thermostatic mixing valves designed for emergency fixture supply applications. Temperature downstream of the mixing valves shall be maintained with electric heat trace for temperature maintenance. The systems shall also be provided with provisions to periodically bleed off a limited quantity of water to avoid stagnation.

All water systems shall require chlorination and testing prior to being put into service.

Cold, hot, and hot water return piping shall be Type "L" copper with lead free joints. All potable water piping shall be insulated with 1" thick fiberglass insulation. Non-potable/protected cold water piping shall be insulated the same as the potable system. Non-potable/protected hot water shall be covered with 1½ inch thick insulation.

Isolation valves shall be ball valves with 316 stainless steel balls and stems.

D2030 SANITARY WASTE

D2030.01 Sanitary, Waste and Vent Drainage System:

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A gravity system of sanitary waste and vent piping shall be provided to serve all fixtures, equipment and drains requiring same. Sanitary waste shall flow via gravity piping from the fixtures, drains, and equipment to below slab sanitary piping which will in turn flow to the Uxbridge city sewer. The plumbing scope shall terminate 10' outside the foundation wall.

Public toilet rooms and mechanical rooms shall be provided with floor drains. All floor drains in such spaces shall be equipped with trap primers or similar devices.

The kitchen shall have a dedicated kitchen waste drainage system which shall receive the waste from all sinks, drains and equipment in the kitchen and discharge to an exterior grease trap prior to connecting to the exterior sewage disposal system. Pot sinks, dishwashers and similar grease producing/receiving equipment shall have individual grease traps prior to discharging to the kitchen waste system. This system shall not receive human waste.

### D2030.02 Laboratory Waste System:

Science room sinks, drains, and equipment within the Science rooms will flow via a dedicated lab waste and vent piping system to a lab waste treatment system prior to connection to the building sanitary waste system. The treatment system shall include: Tanks for continuous/batch treatment, mixers, caustic and acid solution tanks with injection pumps, control panel to activate the system components and a pH effluent sensor with strip recorder.

The lab waste system shall run independently to 10' outside the building prior to connecting to the sanitary sewer.

## D2040 RAINWATER DRAINAGE

### D2040.01 Roof/Storm Drainage:

A system of roof drains and interior piping shall be provided for building storm drainage. It is intended that the roof drainage will discharge to the on site storm water drainage and control system. The plumbing scope shall terminate 10' outside the foundation wall.

### D2040.02 Drainage Systems Piping:

Sanitary waste and vent piping, kitchen waste and vent piping, and roof drainage piping shall be cast iron no-hub soil pipe and fittings above grade.

Type "L" copper with DWV fittings above grade for piping 2" and smaller.

Cast iron hub and spigot pipe and fittings buried/below grade.

Roof drainage piping shall be insulated the same as water piping where necessary to insure condensation does not form and damage building finishes or create mildew/mold concerns.

Lab waste and vent piping shall be flame retardant polypropylene pipe and fittings or CPVC pipe and fittings. Below grade lab waste piping fittings shall be of the containment design (double wall).

## D2050 OTHER PLUMBING SYSTEMS

### D2050.01 Natural Gas:

Natural gas shall be piped from the utility company meter fit to boilers, water heaters, science labs, and gas fired cooking equipment in the building requiring natural gas.

Science laboratories shall have gas to lab bench and fume hood outlets piped thru master gas control valves, one per science lab room.

Provide gas train vents thru the roof for all boilers and other equipment equipped with regulators requiring venting to the atmosphere.

**D30 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)**

**D3010 HVAC**

D3010.01 All systems shall be designed and installed in accordance with the following list of reference standards and codes:

- Massachusetts State Building Code, 7th edition.
- International Mechanical Code (2003)
- Local Fire Department requirements
- Inspectional Services Department requirements
- American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- American National Standards Institute (ANSI)
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- Local Electrical, Plumbing and Sanitary codes and requirements.
- National Fuel Gas Code
- American Refrigeration Institute (ARI)
- American Society of Mechanical Engineers (ASME)
- National Electric Code (NEC)
- Underwriters' Laboratories, Inc. (UL) (Applicable standards)
- National Electrical Manufacturers Association (NEMA) (Applicable standards)
- Recommendations of the National Fire Protection Association (NFPA), latest applicable edition adopted, in general and in particular: Sections 90A, 99, 101.
- Occupational Safety and Health Administration (OSHA)

D3010.02 Design Criteria

Exterior Design Conditions	Summer	Winter
• AHU Cooling / Heating Coils	85.7 F db/ 71.3 F wb	1.6 F db
• Exterior Envelope Conditions	85.7 F db/ 71.3 F wb	1.6 F db
• Exterior Wind Assumptions	7-1/2 MPH	15 MPH

D3010.03 Interior Design Conditions

Temperature (tolerance)	Summer	Winter
• Classrooms	N/A	72 F db (+/-4)
• Auditorium	74 F db (+/-4)	72 F db (+/-4)
• Cafeteria/Kitchen	74 F db (+/-4)	72 F db (+/-4)
• Mechanical Rooms	85 F db (+/-5)	55 F db Min
• Electric Room	85 F db (+/-5)	55 F db Min

Indoor Filtration:

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- All Areas 30% Filters (MERV 8 Pre-filter)
- Auditorium, Cafeteria, Gymnasium/Lockers 85% Filters (MERV 13 Secondary)

Ventilation: Outdoor air shall be provided at a rate for each occupant in accordance with ASHRAE Standard. 62.1 – 2008.

- Toilet & Locker Rooms: Exhaust airflow shall be a minimum of 10 air changes per hour.
- Cooling And Heating Loads: In general, load calculations for all areas shall be based on procedures and methods as described in ASHRAE Fundamentals, 2005 edition.

### Classroom:

- Classrooms, teaching and support spaces shall be served by a 45,000 CFM central station variable air volume heating and ventilating air handling units with 33% outside air. Units shall have double wall casing. Each unit shall consist of a mixing box section, MERV 8 pre-filter section, centrifugal supply fan section, hot water pre-heat coil, centrifugal return fan section, MERV 13 secondary filters and future chilled water cooling coil section.
- Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control
- Units will be mounted on high vibration curbs.
- Acceptable manufacturers shall be Trane, Carrier, or York.
- Provide medium pressure/low velocity distribution to local zone terminal boxes with hot water reheat coils. Supply ductwork downstream of terminal units will be low pressure. All supply air ductwork shall be externally insulated. All return air ductwork shall be low pressure.
- Each classroom shall be provided with individual terminal control via space thermostat. Corridor spaces shall have their own terminal control via thermostat at a constant air volume.
- Unit shall be provided with variable frequency drives for both the supply and return fans.
- Provide an add alternate price to provide heat recovery system to all classroom units which will utilize building exhaust air to pre-condition outdoor supply air.
- Provide an add alternate to locate AHU in Mechanical Penthouse.

### D3010.04 Auditorium

The Auditorium shall be served by a 20,000 CFM dedicated single zone nominal 50-ton central station air handling unit. Unit shall have double-wall casing. Unit shall be located on the roof.

The unit shall consist of centrifugal supply fan, outdoor air/return air mixing box, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan, economizer relief, chilled water cooling coil section and vibration isolation curb. Unit shall be provided with variable frequency drives for supply and return fans.

Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.

Low pressure supply and return air ductwork shall distribute air to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.

Provide an add alternate to locate AHU in Mechanical Penthouse.

### D3010.05 Cafeteria/Kitchen:

The Cafeteria & Kitchen shall be served by a 20,000 CFM dedicated single-zone heating and ventilating air handling unit to serve the area. Unit shall be located on the roof.

The unit shall consist of centrifugal supply fan, outdoor air/return air mixing box, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan, economizer relief, future chilled water cooling coil section and vibration isolation curb. Unit shall be provided with variable frequency drives for supply and return fans.

Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.

Low pressure supply and return air ductwork shall distribute air to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.

Provide a UL rated up-blast kitchen hood exhaust fan/gas-fired make-up air unit dedicated to serve the kitchen hood.

Provide an add alternate to locate AHU in Mechanical Penthouse.

**D3010.06 Gymnasium:**

The Gymnasium shall be served by a 20,000 CFM dedicated single-zone heating and ventilating air handling unit. Unit shall be located on the roof.

The unit shall consist of centrifugal supply fan, outdoor air/return air mixing box, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan, economizer relief, future chilled water cooling coil section and vibration isolation curb. Unit shall be provided with variable frequency drives for supply and return fans.

Units shall be furnished with CO<sub>2</sub> detection to provide demand ventilation control.

Low pressure supply and return air ductwork shall distribute air to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.

Provide an add alternate to locate AHU in Mechanical Penthouse.

**D3010.07 Locker Rooms:**

The Locker Rooms shall be served by a 20,000 CFM dedicated 100% outdoor air energy recovery ventilating air handling unit (desiccant based). Unit shall be located on the roof.

The unit shall consist of centrifugal supply fan, enthalpy wheel exhaust energy recovery section, hot water preheat coil, future chilled water cooling coil section, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal exhaust air fan and vibration isolation curb.

Supply and exhaust fans shall be provided with VFD's.

Low pressure supply and exhaust air ductwork shall distribute air to ceiling supply air diffusers and exhaust air registers. All ductwork shall be insulated.

Provide an add alternate to locate AHU in Mechanical Penthouse.

**D3010.08 Administration Area:**

The Administration (and Guidance) area will be served by a 10,000 CFM nominal 25-ton central station air handling unit. Units shall have double wall casing. Unit shall consist of centrifugal supply fan, chilled water cooling coil, hot water coil section, outdoor air intake section, MERV 8



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pre-filter section, MERV 13 secondary filters, centrifugal air return fan and vibration isolation curb.

Provide medium pressure/low velocity distribution to local zone terminal boxes with hot water reheat coils. Supply ductwork downstream of terminal units will be low pressure. All supply air ductwork shall be insulated. All return air ductwork shall be low pressure.

Provide an add alternate to locate AHU in Mechanical Penthouse.

**D3010.09 Media Center:**

The Library will be served by a 20,000 CFM nominal 50-ton central station air handling unit. Units shall have double wall casing. Unit shall consist of centrifugal supply fan, chilled water cooling coil, hot water coil section, outdoor air intake section, MERV 8 pre-filter section, MERV 13 secondary filters, centrifugal air return fan and vibration isolation curb.

Units shall be furnished with CO<sup>2</sup> detection to provide demand ventilation control.

Provide low pressure supply and return air ductwork to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.

Provide an add alternate to locate AHU in Mechanical Penthouse.

**D3010.10 Science Labs/Community/Art Studios**

The Science Labs/Community/Art Studios shall be served by a 20,000 CFM dedicated single-zone heating and ventilating air handling unit. Unit shall be located on the roof.

The unit shall consist of centrifugal supply fan, outdoor air/return air mixing box, hot water preheat coil, MERV 8 pre-filters, MERV 13 secondary filters, centrifugal return air fan, economizer relief, future chilled water cooling coil section and 12" vibration isolation curb. Unit shall be provided with variable frequency drives for supply and return fans.

Units shall be furnished with CO<sup>2</sup> detection to provide demand ventilation control.

Low pressure supply and return air ductwork shall distribute air to ceiling supply air diffusers and return air registers. All supply air ductwork shall be insulated.

Provide an add alternate to locate AHU in Mechanical Penthouse.

**D3010.11 Exhaust Systems:**

Toilet exhaust: Provide centrifugal roof exhaust fans mounted on sound attenuated curbs. All fans shall be provided with TEFC motor, motorized backdraft damper, disconnect switch and weather-proof motor enclosure.

Provide an exhaust fan for each fume hood in the Science classrooms. Each exhaust fan shall be a roof mounted centrifugal utility fan with a 10' high stainless steel discharge stack.

**D3010.12 IDF Closets:**

IDF Closets: Provide a dedicated A/C unit. Each IDF Closet shall receive a wall mounted A/C unit with a remote condensing unit located on the roof.

D3010.13 Sheetmetal:

All medium pressure ductwork shall be 4" pressure class.

All low pressure ductwork shall be 2" pressure class.

All interior and exterior ductwork shall be sealed per SMACNA Class "A".

In general ductwork shall be galvanized unless otherwise specified.

Kitchen hood exhaust ductwork shall be welded black iron steel.

Shower exhaust shall be aluminum.

All ductwork shall be pressure tested.

D3010.14 Boiler Plant:

The school shall be served by a 5,000 MBH central hot water boiler plant. The boiler plant shall consist of:

- (2) Gas-fired high efficiency boilers. Each boiler shall serve 2/3 of the total heating hot water required. Acceptable manufacturers shall be Buderus, Weil McLain, or Burnham.
- Provide two new hot water pumps. Pumps shall be end-suction base-mounted type. Pumps shall operate in a lead/lag configuration where one is primary and one is stand-by. Pumps shall be on variable frequency drives.
- Hot water supply and return piping shall run through-out the structure to all heating elements requiring hot water. Piping >2½" shall be schedule 40 welded steel pipe and piping <2½" shall be type "L" copper, 95/5 soldered joints rated for 150 psi.

Provide fintube radiation at all exterior walls in areas that do not have terminal units.

All exterior stair wells shall be heated with recessed or semi-recessed type hot water cabinet unit heaters at each floor level. Provided with integral thermostat for control.

Vestibules shall be heated with cabinet hot water unit heaters.

Mechanical spaces shall be heated with horizontal hot water unit heaters.

D3010.15 Chiller Plant:

Provide nominal 125 ton(s) packaged air cooled liquid chiller.

Provide two (2) end suction centrifugal chilled water pumps (1 stand-by).

Piping shall be schedule 40 steel with fiberglass insulation.

Chilled water system shall be 25% propylene glycol.

D3010.16 Automatic Temperature Controls:

Provide a complete new Direct Digital Control system for the entire school. Controls shall be a programmable based computer indicating status, temperature setpoints and fault alarms.

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Acceptable vendors shall be Andover, Honeywell or Invensys.

**D40 FIRE PROTECTION****D4010 SPRINKLERS****D4010.01 Wet Pipe**

The building will be equipped with a new wet pipe sprinkler system throughout all areas of the building. Provide a system of piping and heads to provide fully automatic coverage throughout all areas.

Sprinkler system piping shall be hydraulically sized according to the following criteria: Light hazard occupancy 200 sf/head, 0.10 GPM/sf over the hydraulically most remote 1500 sf, including a 250 gpm hose stream allowance.

Piping shall be schedule 40 steel pipe for 1 ½" and smaller and schedule 10 for sizes 2" and larger. Piping shall be seismically braced as required by code.

Building to be zoned for sprinkler coverage. Zoning as a minimum will be by floor and floor areas.

- Each zone control to consist of a supervised isolation valve, check valve, flow switch, and test and drain assembly.

Sprinkler heads to be semi-recessed style in areas with suspended ceilings.

Sprinkler heads in mechanical space and other areas without hung ceilings shall be upright or pendent as required by location.

**D4020 STANDPIPE****D4020.01 Fire Protection Standpipe**

Fire Department standpipes/valves shall be installed on either side of the stage as required by code.

The fire service will connect to the Uxbridge city water system. Should the available water supply not provide for satisfactory operation of the sprinkler system, a fire pump shall be provided to supplement the pressure and volume demands.

**D50 ELECTRICAL****D5010 ELECTRICAL SERVICE AND DISTRIBUTION****D5010.01 Electrical Distribution:**

New 277/480 volt, 3 phase, 4 wire electrical service will be designed for building power. A primary and secondary ductbank, sub-station transformer, and main distribution switchgear system would be installed. Considering the current lighting codes, indoor air quality requirements, plumbing systems requirements and increased power requirements for modern school programs, the designed service size will be approximately 2400 amps. An arch fault and electrical coordination study will be conducted before the final electrical system is installed.

Switchboard shall consist of the required number of vertical sections bolted together to form a rigid assembly. The sides and rear shall be covered with removable bolt-on covers. All edges of front covers or hinged front panels shall be formed. Provide adequate ventilation within the enclosure.

All sections of the switchboard shall be front and rear aligned with depth as required. All protective devices shall be group mounted. Devices shall be front removable and load connections front and rear accessible. Rear access shall be provided.

Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be non-welding silver alloy and arc extinction shall be accomplished by means of DE-ION arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.

The general lighting and power panel boards will be circuit breaker type installed in code gauge galvanized sheet steel cabinets complete with hinged doors, cylinder locks and typed directories. All panelboards will be a dead front design with copper bus bars, a ground bus and neutral bus. All circuit breakers will be molded case, bolt-on type, thermal-magnetic trip, single, two or three-pole as necessary.

Dry type energy efficient transformers per NEMA TP1 and K13, with primary and secondary voltages of 600V and less and capacity ratings 15kVA through 750Kva.

All cores to be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500kVA shall be clamped utilizing insulated bolts through the core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable. Efficiencies shall be tested in accordance with NEMA TPz and rated between 98.5% and 99.5%. There will be minimal heat loss with the case having no appreciable temperature rise.

All classroom, office space and common areas will have dedicated 20 amp circuits with a maximum of five (5) convenience receptacles on each branch. The space will also have dedicated 20 amp computer grade, isolated ground, receptacles with a maximum of three (3) receptacles on each branch.

An emergency generator will be provided for the building to sustain emergency branch equipment and optional standby mechanical, electrical and plumbing systems. Emergency and egress lighting, fire alarm control panels, fire pumps, boilers with associated pumps, ATC control systems, freezers/condensers, dedicated kitchen equipment, and emergency receptacles throughout the building will be powered through the emergency distribution system. The campus generator will be sized to energize 25% to 35% of the connected load through an emergency distribution system which is dependent on the school's requirements.

A combination automatic transfer bypass/isolation switches are required to automatically transfer between the normal and emergency power source. These switches shall be supplied with and provided as part of the engine generator and paralleling switchgear package for sole source system responsibility.

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On 3 phase, 4 wire systems, utilizing ground fault protection, a true 4 pole switch shall be supplied with all four poles mounted on a common shaft. The continuous current rating and the closing and withstand rating of the fourth pole shall be identical to the rating of the main poles.

The combination automatic transfer bypass/isolation switches shall be mounted in a freestanding NEMA 1 enclosure, unless otherwise indicated. Enclosures shall be fabricated from 12 gauge steel. The enclosure shall be sized to exceed minimum wire bending space required by UL 1008.

Both units shall be bused together with silver plated copper bus to provide a complete pre-tested assembly.

### **D5030 COMMUNICATION AND SECURITY**

#### **D5030.01 Fire Alarm System:**

The fire alarm system will be non-coded, analog-addressable system; automatic sensitivity control of certain smoke detectors; and multiplexed signal transmission dedicated to fire alarm service only. Each floor shall be group zoned according to the smoke partition construction, with further breakdown as to the device type. Additional zones shall be dedicated but not limited to:

- Individual Air Handling Units
- Elevator Capture Control
- Elevator Shunt Trip Control

Fire alarm signal indication shall be by manual pull stations, heat and smoke detectors, fire protection water flow and tamper switches.

All fire alarm, supervisory, and trouble system signals shall initiate the identification of signal condition type at the FACP, FPU's, FCC, and remote annunciator. Menuing shall allow further signal information such as location, type of device and device address, record events in the system memory, record events by the system printer and cause the device in alarm LED indicator to latch.

### **D5040 LIGHTING**

#### **D5040.01 Lighting System:**

The lighting package should include 277V, fluorescent luminaires with dimming electronic ballasts and super T-8 or T-5 HO lamps. An architectural lighting control system should be installed, which utilizes a digital control protocol. Each room would operate autonomously and have an entrance station for lighting controls. Dual technology occupancy detectors and room photocells will automatically reduce the mechanical light level and harvest the natural light while maintaining preset work surface light levels.

All lighting throughout the building will be on the lighting control systems, digital bus and programmed on and off cycles are controlled through the system timers. Mechanical and electrical spaces will not follow the building protocol; all lighting in these spaces will have local control with no automated functions. The lighting control system, for off hour building entrance can be over ridden through a local entrance station and the walking path illuminated as occupancy sensors are enabled.

Adequate site lighting will be designed for exterior building perimeters which includes walkways and parking areas. The latest in energy efficient LED sight lighting would be designed for the required surface foot candle levels and automatically controlled through the architectural lighting control system. Local photocells will provide the control system inputs for on and off functions. The LED fixtures will also be dimmed to provide minimal light levels for off hour operation.

**D5080 OTHER ELECTRICAL SYSTEMS**

D5080.01 For the Clock and Communications Programs, Telephone System, Local Sound Systems, Video Distribution System, Clock and Program System, Public Address System, Electronic Safety and Security System and the Copper/Fiber Cabling Systems will be defined within the Technologies Specifications. The Electrical Contractor will be responsible for all conduit and cable tray raceways to support the installation.

**D60 COMMUNICATIONS**

Communications, General Description: information and communication technologies address the various needs of a 21st century high school facility and are being proposed for the new Uxbridge High School project. The Technology Infrastructure encompasses those technologies that will be designed and procured as part of the base building construction project, while the Technology Equipment Phase will equip the facility with specific equipment and services to be specified and procured during the loose equipment and furniture phase of the project.

**D6020 DATA COMMUNICATION SYSTEMS**

**D6020.01 Data (and Telephone) Infrastructure**

Computer technology once isolated to specialized locations within a school is now an integral part of every aspect of both administrative and academic functions, resulting in the requirement that all educational spaces have access to computer network connectivity. Therefore, we are recommending a hybrid delivery system comprised of both hard wired data drops and data drops that support wireless connectivity. New plenum rated Cat 6 cabling will be installed according to ANSI/EIA/TIA standards with a 10G fiber optic backbone between the main equipment room and intermediate technology closets. Fiber Optic connectivity between the Middle/High School and the Elementary School should also be included. This cabling will support computer network requirements; wireless connectivity, and telephone system needs.

**D6030 VOICE COMMUNICATION SYSTEMS**

D6030.01 Telephone Infrastructure: Refer to D6020.01.

**D6030.02 Telephone Equipment**

The use of telephones in public schools has changed dramatically over the past several years. Telephone systems are not only a means of two-way communication between school staff and administrators, but also a vital and necessary tool in facilitating communications between administrators, teachers and parents. We recommend the installation of a new telephone system that supports existing or future district-wide telephony initiatives. The system should interface with the new paging system for public address announcements. All interior spaces should be equipped with appropriate telephone handsets with integrated automated attendant, voicemail and unified messaging features.

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**D6040 AUDIO-VISUAL COMMUNICATION SYSTEMS****D6040.01 CATV Video Infrastructure**

New bidirectional RF video distribution cabling will be installed throughout the building with drops in all classrooms and educational spaces as well as conference rooms and some offices. This will allow the school to utilize CATV broadcast information available at the school.

**D6040.02 Classroom Audio-Video Equipment:**

Enhanced audio/visual systems and equipment are recommended in all classroom and instructional spaces. These systems can greatly enhance the overall experience for both teacher and student and improve student retention and interaction. Every classroom and instructional space should be equipped with new permanently mounted short throw projectors with connections to the teacher's computer workstation location. Interactive white boards with multimedia sound and voice reinforcement should be included in all classrooms.

**D6040.03 Network and computer workstations:**

State-of-the-art computer workstations with flat panel monitors and connections to local area network servers as well as the internet should be included.

**D6040.04 Printers and other network peripherals:**

Networked laser printers in classrooms and/or major administrative areas should be included.

**D6040.05 Classroom document cameras:**

Document camera equipment in every classroom and instructional space with a connection to the teacher's computer and permanently mounted projectors should be considered.

**D6040.06 Mobile Laptop Carts:**

Mobile laptop carts equipped with laptop computers, wireless access device(s), printer, power strip, etc, should be considered as a means of expanding the functions of the computer lab through-out the school.

**D6040.07 Multimedia carts:**

A higher end projector with dedicated laptop computer, DVD and local sound equipment provides access to high end projection technology in spaces that may not be equipped with permanently mounted projectors, like the cafeteria, gymnasium, media center, etc.

**D6040.08 Wireless access network hardware**

Cabling will be provided as part of the Technology Infrastructure to allow for the installation of wireless access devices and controllers during the equipment phase that will provide wireless connectivity through-out the school for teachers, administrators and students.

**D6040.09 General Space considerations:**

**Classrooms:** we recommend that all Classrooms be outfitted with voice, data and video technologies for student and teacher use. Every classroom should have a "teacher's workstation" with connections to network, telephone, and audio-video resources/equipment in each room. Classroom telephones will be wall mounted adjacent to the door or incorporated into the teacher's workstation area. Typical classrooms will also consist of two data jacks at the teacher computer location, with additional hard wired connections as required. Data jacks for wireless access devices will be installed in all classrooms and other spaces.

**Computer Labs:** Computer Labs should have the same audio-video components as classrooms, but with several additional enhanced features such as voice reinforcement technology with additional ceiling speakers and wireless microphones to allow for teachers to more clearly broadcast over the higher ambient noise levels of these spaces. Structured cabling should accommodate all student workstations including additional peripherals such as printers, scanner, etc.

**Media Center:** The Media Center should have hard-wired computers for electronic card catalogue use and research. It should also have a group of hardwired computers for general use. The Media Center Specialist will have a hardwired computer and a telephone at the circulation desk. The Media Center is also a perfect application for the use of wireless technology.

**Offices:** All administrative workstation locations should be equipped with two data outlets and one telephone outlet for a desk phone. Additional data and voice outlets should be provided for shared resources, such as printers and fax machines.

**Larger Meeting Areas:** Areas such as gymnasium, cafeteria, conference rooms, auditorium, etc., should be equipped with both hard wired and wireless connectivity to support the data needs of various types of large group meetings.

**D6040.10 Auditorium Sound system:**

Refer to Appendix B.

**D6060 DISTRIBUTED COMMUNICATIONS AND MONITORING SYSTEMS**

**D6060.01 Public Address and Master Clock System:**

New Public Address and Master Clock system should be included with ceiling speakers in all hallways and rooms. Volume controlled speakers should be used in all offices and conference rooms. The system will have a master clock mechanism that will control secondary analog and/or digital clocks installed throughout. The system will include an interface to the telephone system for paging announcements from the telephone system. The system will be equipped with a network and/or web based interface to allow for easy programming and control of system features and functions.

**D70 ELECTRONIC SAFETY AND SECURITY**

**D7010 ACCESS CONTROL AND INTRUSION DETECTION SYSTEMS**

**D7010.01 Security System (Intrusion, Access Control and CCTV)**



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Security system includes sensing devices for intrusion detection, access control, and closed circuit television cameras and associated recording equipment. We recommend strategically placed CCTV cameras at main entrances and any other potential sensitive exterior areas. Cameras should be a hybrid digital/IP meaning that they can connect to either a DVR or a network switch for viewing over the data network. Video display locations will be assigned for constant monitoring of all cameras. We recommend all first floor corridors and rooms with an exterior wall have coverage via either motion sensors or door contacts for intrusion detection. All roof access points should be protected by door contacts.

D7020 VOICE COMMUNICATION SYSTEMS

D7030 VOICE COMMUNICATION SYSTEMS

D7040 VOICE COMMUNICATION SYSTEMS

**D80 INTEGRATED AUTOMATION**

**E EQUIPMENT AND FURNISHINGS**

**E10 EQUIPMENT**

E1030 FOOD SERVICE EQUIPMENT

Counters, drainboards, cabinets and drawers: Commercial equipment fabrications from Type 302 or 403 (18-8 alloy) stainless steel, polished to a number 4 finish.

Kitchen Equipment, refer to Appendix C.

E1040 INSTITUTIONAL EQUIPMENT

E1040.01 Education and Scientific Equipment

Laboratory Casework and Countertops: Factory fabricated modular solid plain sliced Red Oak base and wall cabinets including wiring troughs, aluminum linear bar grilles, filler panels, rigid insulation, and blank electrical boxes and other accessories.

- Structure, doors and drawer fronts: Solid Red Oak, plain sawn, 3/4 inch thick minimum.
- Exposed to view plywood: 3/4 inch Red Oak plain sawn plywood having 1/8 inch thick veneer.
- Epoxy resin countertops: 1 inch thick molded black color modified epoxy resin seamless up to 10 foot length, with integral molded sinks and curbs. Include overflows, plugs, strainers and tailpieces which occur above the floor and required for mounting in the equipment. Furnish fittings unattached and unassembled, properly tagged and identified with installation information.
- Base and Wall Cabinets: Totally enclosed cabinet constructed from integrally joined parts; solid ends and backs; flush interior for ease of cleaning.
- Open frame tables for lab stations with 2-1/4 inch square legs, 4-piece construction bolted to solid wood apron frame. Provide built-into tables, electrical receptacle boxes indicated ready for installation of receptacles and wiring.

Fume Hoods: One fume hood per science teaching space, air foil, by-pass, constant-volume type teaching fume hood

Chemical and acid storage cabinets: Lockable double door vented metal storage cabinets fabricated from 8 gage enameled steel. Shelves and case to be covered with 1/4 inch thick non-asbestos transite liner.

Acceptable manufacturers (laboratory cabinets and equipment), or approved equal:

- Institutional Casework, Inc., Campbell Rhea, Paris, TN
- Thermo Fisher Scientific, Two Rivers, WI
- ALC Collegedale, Ooltewah, TN
- Kewaunee Scientific Corporation, Statesville, NC

**E1060 RESIDENTIAL EQUIPMENT**

**E1060.01 Residential Appliances**

Provide residential appliances at Home Economics Lab and Teacher Rooms,, which include the following:

- Electric convection ranges.
- Electric ceramic glass cooktops.
- Microwave ovens.
- Refrigerator/freezers.
- Range hoods.

**E1070 ENTERTAINMENT AND RECREATIONAL EQUIPMENT**

**E1070.01 Theater and Stage Equipment**

Catwalk system: Custom fabricated overhead catwalk system above stage area, with ladders and safety cages.

Stage Curtains and Rigging:

**E1070.02 Athletic Equipment, Backstops:**

Backstops, control devices, backboards and goals. Work includes:

- Backstops: Forward folding, adjustable ceiling-mounted backstops, each with single mast drop frame, equal to Porter No. 949 "Center Strut", electrically operated, shall conform to latest NCAA and NFSHSA recommendations
- Backboards and goals: Steel frame rectangular glass backboard, Official size 72 by 48 inches with 1/2 inch thick safety glass, having bonded Fired vitreous white enamel Border and target markings.
- Goal: Movable rim goal conforming to NCAA and NFSHSA specifications for movable rims. High quality enamel finish, furnish with nylon net.

**E1070.03 Athletic Equipment, Gym Dividers:**

Vertical lift divider gymnasium curtains including all supporting channels and suspension rods, motorized lift unit and remote control devices. Work includes

- Motor Driven, roll-fold divider, overhead supported, lift- type divider curtain.

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- Curtain:  
Bottom 8 feet of curtain is 18 ounce per square yard nylon or polyester reinforced vinyl, having a Class I flame spread rating. Upper curtain  
Upper curtain: White vinyl coated polyester mesh approximately 50 percent open weave and weighing 9 ounces per square yard.

### E1070.04 Batting Cage:

### E1070.05 Athletic Equipment, Gymnasium Equipment

Wall padding, located at all Gymnasium walls, except at bleachers: 1-1/2 or 2 inches thick prefabricated non-tear vinyl laminated wall-mounted panels, in compliance with Class A flame spread and smoke, nominal 2 feet wide by 6 feet tall, with cutouts made in field to fit job conditions.

- Corner wall pad: Prefabricated L-shaped foam corner pads 6 inches by 6 inches by 6 feet tall, thickness matching adjacent wall panels.
- Color: Match orange and white school colors.

#### Volleyball system

- Volleyball standards: Pair of adjustable height telescoping extruded aluminum posts consisting of one end post and one reel post with tensioning winch, complying with International Competition Volleyball Standards, in compliance with all USVBA, NCAA and NFSA recommendations:
- Mounting: 3-1/2" diameter floor sleeves, flush mounted into flooring system.

### E1070.06 Athletic Equipment, Scoreboards:

### E1090 OTHER EQUIPMENT

#### E1090.01 Projection Screens

Classroom Projection Screens: One per teaching space, pull down operated screen having a material area 60 by 60 inches equal to Draper, "Luma2" having a fiberglass matte white screen fabric, mounted above chalkboard frame.

Electrically-operated Projection Screens: Manufacturer's standard UL-listed and marked automatic electric projection screen having glass beaded surface. Units shall factory assembled and consist of case, screen, motor, controls, mounting accessories and other components. Each screen shall be controlled by a station control with 3-position switch with metal device box and flush cover plate for connection to 120 VAC electric power supply.

- Auditorium Screen: Image area of \_\_\_\_ feet by \_\_\_\_ feet
- Café Screen: Image area of \_\_\_\_ feet by \_\_\_\_ feet
- Gymnasium Screen: Image area of \_\_\_\_ feet by \_\_\_\_ feet
- Library Screen: Image area of \_\_\_\_ feet by \_\_\_\_ feet

Acceptable manufacturers (all screen types), or approved equal:

- Bretford Manufacturing Inc., Schiller Park, IL.
- Da-Lite Screen Company, Inc., Warsaw, IN.
- Draper Shade and Screen Company, Inc. Spiceland, IN.
- Stewart Filmscreen Corporation, Torrance, CA.

**E20 FURNISHINGS**

**E2010 FIXED FURNISHINGS**

**E2010.01 Architectural Woodwork, casework.**

Wood veneer casework: Custom shop fabricated and pre-finished casework, AWI Premium Quality Grade, with Grade "A" Red Oak Veneer, quarter sawn finish. Fabrication shall be in flush overlap construction.

- Corridor and Library display cases.
- Library circulation desk and built-in cabinets.
- Main Office reception desk.
- Work room cabinets and mail slots.
- Custom fabricated wood storage units.

Plastic laminate casework and countertops, AWI Premium Quality Grade with general purpose, Grade GP50, laminate at all exposed to view surfaces. Fabrication shall be in flush overlap construction.

- Work room countertops.
- Plastic laminate at casework interiors and shelving where indicated.

Cabinetry case body, and countertops without sinks: Mattformed three layer medium density wood particle panel (PB), graded M2 per ANSI A 208.1 with a minimum density of 48 pounds per cubic foot or equivalent hardwood plugged plywood complying with PS 51-71.

- "Formaldehyde Free": Provide board which is fabricated using pre-consumer recycled wood fibers and an exterior-grade urea-formaldehyde free resin binder.

Countertops with sinks, and similar wet conditions: EWA MARINE A-A EXT, fir veneer marine grade plywood, with plugged cores and sanded faces.

Drawers and doors: medium density fiberboard (MDF) conforming to ANSI A208.2 product class MD, fabricated from 100 percent pre-consumer recycled fiber, using formaldehyde free polyurethane/synthetic resin such as methyl diisocyanate (MDI) or (pMDI), having a minimum density of 45 pounds per cubic foot.

**E2010.02 Telescoping Bleachers**

Furnishing and install telescoping gymnasium bleacher seating. Wall attached, telescoping wood bleachers with continuous rows, and self-storing railings at each end. Units with 24 inch row spacing and 24 inch seat spacing, with aisles spaced not more than 15 seats apart. Seat rows shall have a rise not less than 9-1/2 inches and not more than 10-1/2 inches.

- Provide custom painted graphics on bleacher risers.

Acceptable Manufacturers, or approved equal:

- Hussey Seating Company, North Berwick ME.
- Folding Bleachers Company, Effingham IL
- Interkal Inc., Kalamazoo, MI.

**E2010.03 Fixed Audience Seating:**

Auditorium Seating: 200 floor attached type chairs, 19, 20, 21 and 22 inch widths, consisting of an attached inner upholstered back and hinged fully upholstered seat which automatically

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returns to an upright three-quarter fold position. Irwin Seating product: "Citation 41286", or approved equal having Floor mounted formed steel standards with self-lifting seats, padded and upholstered with one-piece injection molded outer panel and hardwood inner upholstery panels.

- Not more than 15 percent of all seating may be 19 inches.
- Provide armless seats in compliance with accessibility requirements, where indicated on the Drawings.
- Provide transfer seats in compliance with accessibility requirements.
- Provide accessible locations as indicated.

Acceptable Manufacturers, or approved equal:

- Hussey Products Company, North Berwick ME.
- Irwin Seating Company, Grand Rapids MI.
- KI Furniture and Seating, Green Bay WI.

**F SPECIAL CONSTRUCTION AND DECONSTRUCTION****F10 SPECIAL CONSTRUCTION****F20 SPECIAL CONSTRUCTION**

F2040 DO NOT DELETE

F2060 ATHLETIC AND RECREATIONAL SPECIAL CONSTRUCTION

**F30 FACULTY REMEDIATION**

F3010 HAZARDOUS MATERIALS REMEDIATION (NOT APPLICABLE)

**F40 DEMOLITION**

F4010 STRUCTURE DEMOLITION (NOT APPLICABLE)

**G SITEWORK****G10 SITE PREPARATION****G1010 SITE CLEARING:**

Tree & shrub vegetation clearing, grubbing and removal as required to accommodate new construction shown on Drawings.

Furnish, install and maintain erosion & sedimentation controls, temporary swales, and siltation basins in accordance with DEP best management practices. Comply with any Orders of Conditions issued for the project by the Town of Uxbridge Conservation Commission and/or the Massachusetts Department of Environmental Protection.

Maintain temporary protective barriers through the course of construction.

Maintain safe access for emergency vehicles.

**G1020 SITE ELEMENTS DEMOLITION**

**Preparation:** Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain. Utilize coverage, partitions, and weatherproofing to prevent soilage, damage, and spread of dust or fumes to areas and items outside demolition area. Locate, identify, cap off, and disconnect utility services that are not indicated to remain.

**Demolition:** Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on the Contract Drawings in accordance with demolition schedule and governing regulations.

**Disposal of Demolished Materials:** Remove from site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.

**Cleanup and Repair:** Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.

**G1030 SITE EARTHWORK**

Excavation for building foundations, utilities, pedestrian and parking areas including bracing and support as required. Preparation of subgrade and bearing surfaces including proof rolling and dewatering. Placement and compaction of fills from onsite and offsite sources. Compact fill layers below building and pavement with granular fill to 95% Maximum Dry Density, per ASTM 1557. Fill in landscape areas will meet the specifications for common fill and requires compaction to 90% Maximum Dry Density. Preparation of subbase and base courses for building and pavement. Preparation of landscaping areas including placement of topsoil.

**G20 SITE IMPROVEMENTS**

**G2010 ROADWAYS:**

**Bituminous Pavement:** Bituminous concrete pavement shall consist of the following: 8-inch Gravel Borrow for Aggregate Base complying with Massachusetts Highway Department (MHD) Specifications Section M1.03.0 Type "C", 4-inch Dense Graded Crushed Stone complying with MHD Specification Section M2.01.7, 2" Type I-1 Bituminous Concrete Binder conforming to MHD Specification Section M3.11.00, and 2" Type I-1 Bituminous Concrete Top Course conforming to MHD Specification Section M3.11.00.

- Full Depth roadway construction in widening areas. Clearing and grubbing, and removal of some trees.
- Cold plane and overlay of entire roadway within the limits of the widening.

**Wheelchair Ramps:** Wheelchair Ramps shall be provided at all pedestrian crossings in compliance with the Americans with Disabilities Act (ADA). Ramps and landings shall be 4-inch concrete, air entrained, 4,000 psi at 28 days. Ramps and landings shall be a minimum of 4-feet and transition slopes shall be a maximum of 12:1.

**Pavement Marking:** Marking paint for crosswalks and lane markings shall be fast drying white traffic paint and fast drying yellow traffic paint as specified in MHD Standard Specifications under Sections M7.01.10, and M7.01.11, respectively. Work under this item shall be in conformance with Section 860 of the Standard Specifications and the Manual on Uniform

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Traffic Control Devices. Paint shall be applied with mechanical equipment to produce uniform straight edges, in two coats, at manufacturer's recommended rates.

Curb: Curbing shall be vertical granite curb Type VA4 as specified in MHD Standard Specifications under Section M9.04.01. Stones to be set on a radius of 100 feet or less shall be cut to the required curvature.

Intersection warning signs with flashing yellow beacon (source of power - solar panels).

Traffic Signs, reflectorized aluminum, galvanized steel post, as shown on plan.

### G2020 PARKING LOTS:

Bituminous Pavement: Bituminous concrete pavement shall consist of the following: 8-inch Gravel Borrow for Aggregate Base complying with Massachusetts Highway Department (MHD) Specifications Section M1.03.0 Type "C", 4-inch Dense Graded Crushed Stone complying with MHD Specification Section M2.01.7, 2" Type I-1 Bituminous Concrete Binder conforming to MHD Specification Section M3.11.00, and 2" Type I-1 Bituminous Concrete Top Course conforming to MHD Specification Section M3.11.00.

Pavement Marking: Marking paint for crosswalks and lane markings shall be fast drying white traffic paint and fast drying yellow traffic paint as specified in MHD Standard Specifications under Sections M7.01.10, and M7.01.11, respectively. Work under this item shall be in conformance with Section 860 of the Standard Specifications and the Manual on Uniform Traffic Control Devices. Paint shall be applied with mechanical equipment to produce uniform straight edges, in two coats, at manufacturer's recommended rates.

Curb: Curbing shall be vertical granite curb Type VA4 as specified in MHD Standard Specifications under Section M9.04.01. Stones to be set on a radius of 100 feet or less shall be cut to the required curvature.

Intersection warning signs with flashing yellow beacon (source of power - solar panels).

Regulatory Parking Signs, reflectorized aluminum, galvanized steel post, as shown on plan.

Pedestrian sidewalks will be poured in place Portland cement concrete minimum 4-feet width and 5-inches depth.

Steps: Cast-in-place concrete; standard cements and aggregates; broomed finish. Galvanized steel pipe rail, painted with polyurethane paint system.

Ramps: Cast-in-place concrete; standard cements and aggregates; broomed finish. Widths and slopes conforming to ADAAG and MAAB. Galvanized steel pipe rail, painted with polyurethane paint system.

### G2060 SITE DEVELOPMENT

#### G2060.01 Fences and Gates

Chainlink Fence & Gates: black vinyl coated, thermally fused. Vertical vinyl slats at trash bin enclosure.

Concrete Filled Steel Bollards: schedule 40 steel pipes, hot-dipped galvanized, concrete filled, w/ 2" wide reflective adhesive bands at service areas.

Guardrail – Single faced 4"x10" wood guardrail with wood posts as shown on plans

G2060.02 Playfield Structures

Soccer Field

- Sports turf seed mix
- Automated irrigation system with quick coupler
- 4 pole muscoe sports lighting
- Electric service
- Line striping – marking pins (below grade)
- Drainage 800' 4" perf drain pipe
- 10" gravel sub base
- 6" loam
- Lockable goal and net
- (1) 100 seat bleacher (removable)
- 2 sets Aluminum players benches (20')

Practice Football Field

- Sports turf seed mix
- Automatic irrigation system
- Line striping – marking pins (below grade)
- 10" gravel sub-base
- 6" loam
- 2 sets Aluminum players benches (20')
- Water bubbler

Field Hockey

- Sports turf seed mix
- Automatic irrigation system
- Electric service
- Line striping – marking pins (below grade)
- Drainage- 800' 4" perf pipe
- 10" gravel sub-base
- 6" loam
- 2 sets Aluminum players benches (20')

Track & Field / Football Field:

- 8 lane straight and 6 lane round – all weather -synthetic/colored track
- (1) 200 seat bleacher
- (1) 600 seat bleacher with accessible ramp
- (1) press box – integrated with bleachers
- Sports field turf seed mix inside & outside track
- Line striping – marking pins (below grade)
- (> Add Alt – synthetic turf – 330'x 205')
- 1325' 6' black vinyl chain link fence
- (1) Maintenance gate – 10' double – chain link 6' high



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- (2) 4' wide x 6' high chain link gates
- 1 concession building – prefab 10'x8' with restrooms
- (6) pole muscoe sports light w/controllers
- Electric service
- San. Sewer service w/ejector pump – 300' (4" pipe)

### **Baseball Field**

- 2 foul poles w/wings
- 3 bases & home plate
- 300 seat bleacher
- 100 seat bleacher
- (2) 4 bench dugouts w/metal roof
- 120'/straight backstop
- 200'/6' high chain link fence
- 5' paved walk
- Steps w/steel railing both sides (11 treads)
- Automatic irrigation system w/rain sensor & quick coupler
- Manual sports lighting (6 poles) – muscoe w/controller
- Electric service
- Infield mix
- Sports turf seed mix
- 12" gravel sub-base
- 6" loam
- Drainage- 1200' 4" perf pipe in 12"x12" gravel wrapper in filter fabric
- 1 area drain
- Conc. Pads for dugouts & bleachers
- Water bubbler

### **Tennis Courts**

- 6 bit. Con. Courts w/color & line striping
- 840 lf 10' chain link
- (2) 4' wide x 7' gates
- Courts lighting (4) w/auto controls
- Net supports & nets (6)
- 2 sets Aluminum players benches (20')
- Water bubbler

### **Softball Field**

- 2 foul poles w/wings
- Bases & home plate
- 100' backstop
- (2) 3 bench dugouts w/metal roof
- (3) 5 row bleachers
- 160' 6' chain link fence
- Infield mix
- Sports turf seed mix
- Conc. pads for dugout & bleachers
- 4 pole muscoe sports lights w/controls

- Electric service
- Automated irrigation system w/quick coupler
- Drainage – 1 area drain
- 500' 4" perf. Pipe in 12 x 12" gravel/wrapped in filter fabric
- 8" gravel subgrade
- 6" loam

**G2080 LANDSCAPING**

Site Lighting (roadway lighting, parking area lighting, pedestrian lighting, accent lighting)

Site furnishings (benches, bollards, receptacles, bike racks)

Site signage.

Planting standards, methods, schedule (trees, shrubs, groundcover-perennials-grasses, loam, amendments, seed, hydro-seed, mulch, establishment, maintenance, etc.)

Irrigation (temporary/ permanent)

Fences (black vinyl chainlink)

**G30 SITE CIVIL/MECHANICAL UTILITIES**

**G3010 UTILITIES**

Ductile Iron Pipe and Fittings for Water Distribution: Water distribution mains shall be assumed to be 12-inch diameter. Fire service connections to buildings shall be assumed to be 8-inch diameter and domestic water service connections to buildings shall be assumed to be 6-inch diameter. All ductile iron water pipe shall conform to American Water Works Association (AWWA) C150 and AWWA C151. Water distributions systems shall be Class 52 ductile iron pipe with push-on or mechanical joints with gaskets conforming to AWWA C111. Ductile iron water pipe shall be double cement lined inside and asphalt seal coated in accordance with AWWA C104. 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.

Hydrants: Fire hydrants shall have 6-inch mechanical joint inlet connections to the main, two 2-inch hose connections, 180-degrees apart, and one 4-inch steamer connection with valve openings 5-inches in diameter minimum in the valve seat. The standpipe shall have an 8 -inch minimum diameter. Hydrants shall have mechanical joint shoes, 5-feet 6-inches bury, 5-inch valve, and conform to the most recent revision of AWWA Specification C-502. Hydrants shall be thoroughly cleaned and given two shop or field coats of paint in accordance with AWWA C502. Hydrants shall be installed in conformance to AWWA C600 Section 11 using thrust blocks and restrained joints.

Disinfection of Water Mains and Appurtenances: All pipelines shall be disinfected, after testing and prior to being placed into service, in accordance with the AWWA Standard C651.

Hydrostatic Tests: After the pipe is laid, the joints completed, fire hydrants permanently installed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of water supply lines or water service piping shall,

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unless otherwise specified, be subject for 2 hours to a hydrostatic pressure test of 200 psi as specified in AWWA Standards.

**Polyvinyl Chloride (PVC) Pipe for Sanitary Sewage Conveyance:** Sanitary Sewage pipes shall be assumed to be 6-inch diameter polyvinyl chloride (PVC) pipe. Sanitary Sewage pipe shall be type PSM, SDR-35 PVC pipe conforming to the requirements of American Society for Testing and Materials (ASTM) D3034, current edition. Joints shall be elastomeric, oil resistant gasket joints conforming to the requirements of ASTM D3212, current edition, push-on type. Tee branches, wyes, and fittings shall be type PSM SDR-35 PVC pipe, conforming to ASTM D3034, current edition.

**Sanitary Sewer 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 conforming to the requirements of ASTM A48, Class No. 30. Cement for manholes shall be Type II and concrete shall have a minimum strength of 4,000 psi. Joints between sections of concrete structures shall be sealed with a selfsealing butyl rubber based flexible joint sealant gasket complying with ASTM C443. Manhole Steps and reinforcing rods shall conform to ASTM A615. Manhole frames shall be adjusted to finish course with brick masonry.

**Reinforced Concrete Pipe for Stormwater Conveyance:** Stormwater collected within catch basins on site and on rooftops shall be conveyed through a closed drainage system using reinforced concrete pipe (RCP). The RCP pipe shall be sized utilizing accepted engineering practices for closed drainage systems. Reinforced Concrete pipe shall conform to ASTM "Specifications for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe," Designation: C76 and shall be wall B for the class IV. Type II cement shall be used unless otherwise approved by the Engineer. The pipe shall have an interior surface that is smooth and even, free from roughness, projections, indentations, offsets, or irregularities of any kind. Pipe joints for all reinforced concrete pipe shall be of the rubber gasket type. Joints and gaskets for pipe shall be the O-ring gasket type and shall conform to the requirements of ASTM C443.

**Storm Drain 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 H20 loadings. Frames and covers shall be of cast iron conforming to the requirements of ASTM A48, Class No. 30. Cement for manholes shall be Type II and concrete shall have a minimum strength of 4,000 psi. Joints between sections of concrete structures shall be sealed with a selfsealing butyl rubber based flexible joint sealant gasket complying with ASTM C443. Manhole Steps and reinforcing rods shall conform to ASTM A615. Manhole frames shall be adjusted to finish course with brick masonry.

**Catch Basins:** Precast reinforced concrete catch basins shall comply with material, design, and construction standards specified under ASTM C478. Frames and grates shall be of 4-flange cast iron. Catch basins shall have removable hoods and a minimum 4-foot deep sump.

**Water Quality Structures:** The water quality structure shall have a proven record of having the capability to remove a minimum of 75% of the sediment load from the low-flow storm conditions from the total catchment area of the drainage system. The structure must be capable of removing the silt and clay-sized particles. The water quality structure shall be installed underground as part of the stormwater system and be designed to accept AASHTO H-20 Loading. The water quality structure shall be equipped with a high flow bypass and without

backwater conditions so as to prevent re-suspension of material. The structure shall be maintainable from the surface.

**G40 ELECTRICAL SITE IMPROVEMENTS**

Refer to Drawings.

**G50 SITE COMMUNICATIONS**

Refer to Drawings.

**G90 OTHER SITE CONSTRUCTION**

Refer to Drawings.

# **APPENDIX A**

## **MA-CHPS SCORECARD**

**UXBRIDGE HIGH SCHOOL**  
Quaker Highway  
Uxbridge, Massachusetts

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<b>INTEGRATION &amp; INNOVATION (11 Possible Points)</b>	<b>Available</b>	<b>Targeted</b>
II.P1 Integrated Design	P	P
II.P2 Educational Display	P	P
II.C1 Demonstration Areas	1	1
II.C2 Innovation	1 THRU 4	?
II.C3 Life Cycle Cost Analysis	3	?
II.C4 School Garden	1	1
II.C5 School Master Plan	1	?

<b>INDOOR ENVIRONMENTAL QUALITY (23 Possible Points)</b>	<b>Available</b>	<b>Targeted</b>
EQ.P1 HVAC Design - ASHRAE 62.1	P	P
EQ.P2 Construction IAQ Management	P	P
EQ.P3 Pollutant and Chemical Source Control	P	P
EQ.P4 Moisture Management	P	P
EQ.P5 Minimum Filtration	P	P
EQ.P6 Thermal Comfort - ASHRAE 55	P	P
EQ.P7 View Windows, 70%	P	P
EQ.P8 Eliminate Glare	P	P
EQ.P9 Minimum Acoustical Performance	P	P
EQ.P10 Minimum Low Emitting Materials	P	P
EQ.C1 Access to Views, 80 - 90%	1 THRU 2	2
EQ.C2 Daylighting in Classrooms	1 THRU 6	?
EQ.C3 Low-Emitting Materials	1 THRU 4	2
EQ.C4 Ducted Returns	1	1
EQ.C5 Enhanced Filtration	1	1
EQ.C6 Post-Construction IAQ	1	1
EQ.C7 Enhanced Acoustical Performance	1	2
EQ.C8 Controllability of Systems	1 THRU 4	2
EQ.C9 Duct Access & Cleaning	1	1
EQ.C10 Electric Lighting	1	1

<b>ENERGY (36 Possible Points)</b>	<b>Available</b>	<b>Targeted</b>
EE.P1 Minimum Energy Performance, 20%	P	P
EE.P2 Commissioning	P	P
EE.P3 Facility Staff & Occupant Training	P	P
EE.C1 Superior Energy Performance (Performance Approach)	2 Thru 15	6
EE.C2 Minimize Air Conditioning	2 Thru 4	3
EE.C3.1 Renewable Energy - Electricity Production	1 Thru 3	0
EE.C3.2 Renewable Energy - Heating/Cooling	1 Thru 12	1
EE.C4 Plug Load Reduction & ENERGY STAR Equipment	1	1
EE.C5 Energy Management System and Sub Metering	1 Thru 3	3
EE.C6 Flex Energy	1 Thru 2	2

<b>WATER (16 Possible Points)</b>	<b>Available</b>	<b>Targeted</b>
WE.P1 Irrigation System Performance on Recreational Fields	P	
WE.P2 Indoor Water Use Reduction, 20%	P	
WE.C1 Indoor Water Use Reduction, 30-50%	1 Thru 3	1
WE.C2 Reduce Potable Water Use for Sewage Conveyance	4	4
WE.C3 No Potable Water Use for Non-Recreational Landscaping Areas	3	?
WE.C4 Reduce Potable Water Use for Recreation Landscaping Areas	2	2
WE.C5 Irrigation System Commissioning	1	0
WE.C6 Water Management System	1 Thru 3	1

<b>SITE (16 Possible Points)</b>	<b>Available</b>	<b>Targeted</b>
SS.P1 Joint Use of Facilities and Parks	P	P
SS.C1 Sustainable Site Selection	1 Thru 5	1
SS.C2 Central Location	1	0
SS.C3 Reduced Building Footprint	1	1
SS.C4 Building Layout & Microclimates	1	1
SS.C5 Public Transportation	1	0
SS.C6 Pedestrian/ Bike/ Human Powered Transportation	2	2
SS.C7 Parking Minimization	1	1
SS.C8 Post-Construction Stormwater Management	1	1
SS.C9 Reduce Heat Islands - Landscaping	1	0
SS.C10 Heat Islands – Cool Roofs	1	0
SS.C11 Light Pollution Reduction	1	1

<b>MATERIALS &amp; WASTE MANAGEMENT (14 Possible Points)</b>	<b>Available</b>	<b>Targeted</b>
MW.P1 Storage and Collection of Recyclables	P	P
MW.P2 Minimum Construction Site Waste Management, 75%	P	P
MW.C1 Minimum Construction Site Waste Management, 90%	1	1
MW.C2 Single Attribute - Recycled Content	1 Thru 2	1
MW.C3 Single Attribute - Rapidly Renewable Materials	1	?
MW.C4 Single Attribute - Certified Wood	1	1
MW.C5 Single Attribute - Regional Materials	1 Thru 2	1
MW.C6 Materials Re-Use	1	0
MW.C7 Durable and Low maintenance Flooring	1	?
MW.C8 Building Reuse - Exterior	1 Thru 4	0
MW.C9 Building Reduce - Interior	1	0



<b>OPERATIONS &amp; MAINTENANCE (9 Possible Points)</b>	<b>Available</b>	<b>Targeted</b>
OM.P1 Maintenance Plan	P	P
OM.P2 Anti-Idling Measures	P	P
OM.P3 Green Cleaning	P	P
OM.C1 Work Order and Maintenance Management System	1	1
OM.C2 Indoor Environmental Management Plan	1 Thru 3	3
OM.C3 Green Power	1	0
OM.C4 Climate Change Action: Diesel Bus Retrofit	1	0
OM.C5 Carbon Footprint Reporting	1	?
OM.C6 Energy Benchmarking	3	?
<b>TOTAL POSSIBLE POINTS</b>	<b>127</b>	<b>55</b>

See Note 1.

**Massachusetts Collaborative for High Performance Schools Protocol**

2009 Edition Criteria for New Construction

**Verification Levels**

Verified: 40 Points Minimum, Plus All Prerequisites

Verified Leader: 50 Points Minimum, Plus All Prerequisites

**NOTES:**

1. Project Targeting Verified Leader Status

**Proposed Space Summary - Uxbridge High School - New Building**

UXBRIDGE HIGH SCHOOL		Existing Conditions			Proposed			MSEA Guidelines (600 Students) (refer to MSEA Educational Program & Space Standard Guidelines)				
ROOM TYPE	ROOM NSF <sup>1</sup>	# OF RMS	area totals		ROOM NSF <sup>1</sup>	# OF RMS	area totals	Comments	ROOM NSF <sup>1</sup>	# OF RMS	area totals	Comments
CORE ACADEMIC SPACES				23,925								
(List classrooms of different sizes separately)												
Classroom - General	555	1			800	14	11,200	no or unit ventilators + communal storage rooms	900	20	19,000	850 SF min - 950 SF max (20 seats)
Classroom - General	800	1			825	1	825					
Classroom - General	690	4	2,760		900	1	900					
Classroom - General	715	2	1,430		600	4	2,400	acoustical divider between two c's if need ly or				
Classroom - General	720	3	2,160									
Classroom - General	775	2	1,550									
Classroom - General	795	1	795									
Classroom - General	815	1	815									
Classroom - General	835	1	835									
Classroom - General	845	2	1,690									
Classroom - General	860	1	860									
Classroom - General			0									
Science Classroom / Lab	1105	1	1,105		1,220	4	4,880		1,200	6	7,200	1 period/day/student (20 seats)
Science Classroom / Lab	1085	1	1,085									
Science Classroom / Lab	1095	1	1,095									
Science Classroom / Lab	985	1	985									
Science Classroom / Lab	125	1	125		360	2	720		80	6	480	
Science Prep Room	120	1	120									
Science Greenhouse	150	1	150									
Science Physics/Tech - Classroom	670	1	670		850	1	850					
Science Physics/Tech Lab - Tools/Benches	1335	1	1,335		1,400	1	1,400					
Science Physics/Tech - Office	100	1	100									
Science Physics/Tech - Storage	130	1	130									
Foreign Language Lab	815	1	815		1,100	1	1,100					
Small Group Seminar (20-30 seats)	425	1	425					use breakout areas + smll classrooms	500	1	500	
Large Group Instruction	680	1	680		200	2	400					
Breakout / Presentation			0									
Teacher Planning Center (10 per - hold style)			0									
Teacher Toilets			0		50	6	300					
Teachers Work Room	130	1	130		900	2	1,800	one ea floor of classroom wing				
Teacher Telephone/Quiet Room	60	1	60		70	5	350	located off teacher workroom				
Science Dept Office	540	1	540									
Instructional Materials Storage (communal)			285		1,000	1	1,000	@220 + @280 + @300 + @900				

UXBRIDGE HIGH SCHOOL	Existing Conditions	
	ROOM NSF <sup>1</sup>	# OF RMS area totals
<b>SPECIAL EDUCATION</b>		<b>3,595</b>
(List classrooms of different sizes separately)		
Self-Contained SPED w/IT (Life Skills)	1205	1
Self-Contained Toilet		0
Academic Support Center (ASC)	755	1
Alternative Ed (Mosaic) CR	755	1
Alternative Ed Office / Patient Rm	160	1
Alternative Ed Toilet	65	2
OT / PT / Speech / Testing	580	1
ESL Office / Consultation		0
Resource Room		0
Small Group Room (Learning Centers)		0
SPED Conference		0
SPED Records		0
<b>ART &amp; MUSIC</b>		<b>3,335</b>
Art Studio - Digital Arts	220	1
Art Studio w/ Storage	1640	1
Art Ceramics Studio	805	1
Art Ceramics - Kiln	220	1
Art Office	250	1
Art Photo Darkroom	290	1
Band/Chorus - 50-100 seats		0
Ensemble		0
Music Practice		0
Music Office	160	1
Music Storage	160	1
<b>VOCATIONS &amp; TECHNOLOGY</b>		<b>9,075</b>
Tech Ctrm. - CAD / Design Computer Lab	925	1
Tech Ctrm. - Misc Computer Labs	755	1
Tech Ctrm. - Misc Computer Labs	835	1
Tech Classroom	410	1
Tech Ctrm. - TV/Video Production (digital lab)	1200	1
Tech Ctrm. - TV/Video Studio		0
Tech Ctrm. - TV/Video Control	145	1
Tech Ctrm. - TV/Video Office	170	1
Tech Ctrm. - TV/Video Storage		0
Tech Ctrm. - TV/Video Self-Contained Toilet		0
Tech Ctrm. - Fam/Consumer Sci. - CR	765	1
Tech Ctrm. - Fam/Consumer Sci. - CR/Lab	1220	1
Tech Ctrm. - Fam/Consumer Sci. - Storage/Laundry	170	1
Tech Shop - Fabrication Lab	2205	1
Tech Shop - Wood Storage	115	1
Tech Shop - Tool Storage	160	1
Tech Ctrm. - Early Childhood		0

Proposed		
ROOM NSF <sup>1</sup>	# OF RMS area totals	Comments
	<b>3,840</b>	
1,200	1	spartan cabs
890	1	890 820 + tel room @ 70
800	1	800 mosaic
175	2	350 one along corridor wall - potential for flexible use
	0	
240	1	240 flex space along corridor @ guidance also wall
	0	
380	1	380
	0	see guidance
	0	see guidance
	<b>4,070</b>	
	0	mac lab at tv production to be used for digital art
1,270	1	1,270
800	1	800
100	1	100
1,600	1	1,500
200	1	200
75	2	150
50	1	50
	<b>5,140</b>	
1,000	1	1,000
	0	
	0	
	0	
1,200	1	mac lab for editing (share with digital art)
600	1	600 provide separate entry after-hours
150	1	150
150	1	150
80	1	80
50	1	50 required for after-hours tv studio work
860	1	850
1,200	1	1,200
130	2	260 @ 125 + 1 @ 135
2,200	1	2,200
200	1	200
200	1	200
	0	

MSBA Guidelines (600 Students) (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM NSF <sup>1</sup>	# OF RMS	area totals	Comments
		<b>8,040</b>	
850	4	3,400	assumed 8% of pop. in self-contained SPED
80	4	240	
500	2	1,000	1/2 size Gent. Ctrm.
500	2	1,000	1/2 size Gent. Ctrm.
		<b>3,200</b>	
1,350	1	1,350	Assumed use - 25% Population - 5 times/week
1,500	1	1,500	Assumed use - 25% Population - 5 times/week
200	1	200	
75	2	150	
		<b>9,900</b>	
1,200	3	3,600	Assumed use - 50% Population - 5 times/week
2,000	3	6,000	Assumed use - 50% Population - 5 times/week

UXBRIDGE HIGH SCHOOL	Existing Conditions		
	ROOM NSF <sup>1</sup>	# OF RMS	area totals
<b>HEALTH &amp; PHYSICAL EDUCATION</b>			<b>14,139</b>
Gymnasium	7080	1	7,080
PE Alternatives (Weights/Fitness)	1125	1	1,125
PE Alternatives (Dance, Aerobics, etc.)			0
Gym Storeroom	185	1	185
Gym Storeroom	325	1	325
Student Store / Concessions	130	1	130
Boys Locker Rooms w/Toilets & Shwrs	1410	1	1,410
Boys Team Room	650	1	650
Boys PE Instructor's Office w/Shwr & Toilet	245	1	245
Girls Locker Rooms w/Toilets & Shwrs	1485	1	1,485
Girls Team Room			0
Girls PE Instructor's Office w/Shwr & Toilet	220	1	220
Phys. Ed. Storage	650	1	650
Athletic Storage	155	1	155
Athletic Director's Office	285	1	285
Athletic Director's Toilet	45	1	45
Coach Office (shared male/female)			0
Coach Shwr & Toilet (male & female)			0
Athletic Trainer	140	1	140
Referee Changing w/Shower & Toilet			0
<b>MEDIA CENTER</b>			<b>3,455</b>
Media Center/Reading Room	2990	1	2,990
Media Center Office			0
Media Center Work Rm / Storage / AV	465	1	465
Media Center Conf / Video Conf			0
Media Center Collaboration Rm (quiet study)			0
<b>AUDITORIUM / DRAMA</b>			<b>5,150</b>
Auditorium (400 seats)	4400	1	4,400
Stage	700	1	700
Auditorium Storage			0
Centrals / Lighting / Projection	50	1	50
Make-up / Dressing Rooms			0
<b>DINING &amp; FOOD SERVICE</b>			<b>5,645</b>
Cafeteria / Student Lounge Break-out	3335	1	3,335
Chair / Table Storage			0
Kitchen/Walk-In/Office/Storage/Toilet/Cust Closet	1705	1	1,705
Serving			0
Staff Lunch Room	425	1	425
Dishwashing	180	1	180

Proposed			
ROOM NSF <sup>1</sup>	# OF RMS	area totals	Comments
		<b>15,995</b>	
10,000	1	10,000	
3,000	1	3,000	
1,500	1	1,500	
1,500	1	1,500	
400	1	400	
		0	
200	1	200	gym lobby
1,245	1	1,245	975 + 270
580	1	580	
525	1	525	150 + 155 + 220
1,245	1	1,245	975 + 270
580	1	580	
525	1	525	150 + 155 + 220
330	1	330	140 + 190
		0	use storage units outside
150	1	150	
		0	
		0	0 share pe instructor office/closet/toilet
		0	0 share pe instructor office/closet/toilet
215	1	215	
		0	
		0	
		<b>4,380</b>	includes a computer lab in reading room
4,000	1	4,000	
120	1	120	
250	1	250	
		0	
		0	
		<b>7,550</b>	
5,210	1	5,210	over-sized to allow for storage in wings
2,070	1	2,070	0 included in stage wings
280	1	280	includes 90 sf in able to balance sound system
		0	use music practice and ensemble rms
		<b>6,215</b>	
3,000	1	3,000	seating bleeds out to commons - flexible
300	1	300	under tiered auditorium seating
2,445	1	2,445	can't be any smaller
		0	0 included in kitchen (not scramble)
400	1	400	
140	1	140	

MSBA Guidelines (600 Students) (refer to MSBA Educational Program & Space Standard Guidelines)				
ROOM NSF <sup>1</sup>	# OF RMS	area totals	Comments	
		<b>17,000</b>		
10,000	1	10,000		
3,000	1	3,000		
300	1	300		
1,400	1	1,400		
125	1	125		
1,400	1	1,400		
125	1	125		
500	1	500		
150	1	150		
		<b>3,650</b>		
3,650	1	3,650		
		<b>5,800</b>		
4,000	1	4,000	273 Enrollment @ 10 SF/Seat - 750 seats MAX	
1,800	1	1,800		
400	1	400		
200	1	200		
300	2	600		
		<b>5,800</b>		
3,000	1	3,000	3 seatings - 15SF per seat (200 seats)	
300	1	300		
1,900	1	1,900	1600 SF for first 300 + 1 SF/student Adfr	
400	1	400	20 SF/occupant (20 Occs)	

MSBA Guidelines (600 Students) (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM NSF <sup>1</sup>	# OF RMS	area totals	Comments
250	1	250	710 sf Allowable Suite (not req'd in labridge)
60	1	60	
60	1		
100	1	100	
300	1	300	
		3,370	
300	1	300	
100	1	100	
200	1	200	
200	1	200	
375	1	375	
125	1	125	
150	1	150	
120	1	120	
450	1	450	
100	1	100	
300	1	300	
150	3	450	
100	1	100	
100	1	100	
300	1	300	
		2,075	
150	1	150	
250	1	250	
375	1	375	
400	1	400	
400	1	400	
300	1	300	
200	1	200	



**EXHIBIT C**  
**PROJECT SCHEDULE**  
**TOWN OF UXBRIDGE**

**PROJECT SCOPE & BUDGET AGREEMENT**

# UXBRIDGE HIGH SCHOOL - UXBRIDGE, MA PROJECT SCHEDULE, SEPT 2012 OPENING JULY 19, 2010

J O S L I N  
L E S S E R

Project Management

ID	Task Name	Duration	Start	Finish	Predecessors	2009	2010	2011	2012	2013
1	Execute OPM Contract	0 days	Wed 4/8/09	Wed 4/8/09		Q1	Q2	Q3	Q4	Q1
2	Selection of Architect	65 days	Thu 4/9/09	Wed 7/8/09		Q1	Q2	Q3	Q4	Q1
12	Project Design	387 days	Thu 7/9/09	Wed 12/29/10						
13	Feasibility Study - Design Program	63 days	Thu 7/9/09	Mon 10/5/09						
25	Feasibility Study - Schematic Design	51 days	Mon 4/5/10	Mon 6/14/10						
26	Schematic Design	51 days	Mon 4/5/10	Mon 6/14/10						
27	Cost Estimate	16 days	Fri 5/21/10	Fri 6/11/10						
28	Schematic Design Public Forum #1	0 days	Mon 4/5/10	Mon 4/5/10						
29	Schematic Design Public Forum #2	0 days	Wed 5/12/10	Wed 5/12/10						
30	Schematic Design Public Forum #3	0 days	Tue 6/15/10	Tue 6/15/10						
31	Town Meeting - Project Approval	0 days	Sat 6/19/10	Sat 6/19/10						
32	Town Election - Debt Exclusion	0 days	Mon 6/21/10	Mon 6/21/10						
33	Design Development	50 days	Thu 7/29/10	Wed 10/6/10						
34	Design Work	8 wks	Thu 7/29/10	Wed 9/22/10						
35	Review Meetings	2 wks	Thu 9/23/10	Wed 10/6/10						
36	Cost Estimate	2 wks	Thu 9/23/10	Wed 10/6/10						
37	Construction Documents	70 days	Thu 9/23/10	Wed 12/29/10						
38	Construction Documents - 60%	30 days	Thu 9/23/10	Wed 11/3/10						
39	Design Work	4 wks	Thu 9/23/10	Wed 10/20/10						
40	Review Meetings	2 wks	Thu 10/21/10	Wed 11/3/10						
41	Cost Estimate	2 wks	Thu 10/21/10	Wed 11/3/10						
42	Construction Documents - 90%	40 days	Thu 11/4/10	Wed 12/29/10						
43	Design Work	4 wks	Thu 11/4/10	Wed 12/1/10						
44	Review Meetings	2 wks	Thu 12/2/10	Wed 12/15/10						
45	Cost Estimate	2 wks	Thu 12/2/10	Wed 12/15/10						
46	Redi-check	2 wks	Thu 12/2/10	Wed 12/15/10						
47	Final drawing review	2 wks	Thu 12/16/10	Wed 12/29/10						
48	MSBA	401 days	Thu 4/16/09	Tue 10/26/10						
49	MSBA approval of Design RFS	10 days	Thu 4/16/09	Wed 4/29/09						
50	MSBA staff review alternatives/solution	125 days	Fri 10/9/09	Wed 3/31/10						
51	MSBA board approval of preferred FS alternative	0 days	Wed 3/31/10	Wed 3/31/10						
52	MSBA Project Scope & Budget Conf.	0 days	Fri 7/16/10	Fri 7/16/10						
53	MSBA Board Approval	0 days	Wed 7/28/10	Wed 7/28/10						
54	Execute MSBA Funding Agreement	63 days	Fri 7/30/10	Tue 10/26/10						
55	CM at Risk Selection; Trade Contractor Pre-Qual	121 days	Wed 7/14/10	Wed 12/29/10						
56	Application to and Approval by OIG for CM at Risk	39 days	Wed 7/14/10	Mon 9/6/10						
57	CM at Risk RFQ Process	20 days	Thu 7/22/10	Wed 8/18/10						

Summary

Milestone

Task

Uxbridge High School  
Date: Mon 7/19/10



**UXBRIDGE HIGH SCHOOL - UXBRIDGE, MA**  
**PROJECT SCHEDULE, SEPT 2012 OPENING**  
**JULY 19, 2010**

**J O S L I N**  
**L E S S E R**

**Project Management**

ID	Task Name	Duration	Start	Finish	Predecessors	2009	2010	2011	2012	2013							
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
58	CM at Risk RFP Process and Selection of CM	20 days	Thu 8/19/10	Wed 9/15/10 57													
59	Issue RFQ for Trade Contractors	0 wks	Wed 11/17/10	Wed 11/17/10 39FS+20 days													
60	Trade Contractor Sub-Bids Due	10 days	Thu 11/18/10	Wed 12/1/10 59													
61	Review contractors	4 wks	Thu 12/2/10	Wed 12/29/10 60													
62	Issue bid list	0 days	Wed 12/29/10	Wed 12/29/10 61													
63	Bidding and Contracting	25 days	Wed 12/29/10	Wed 2/2/11													
64	Issue invitation to bid to Trade Contractors	0 days	Wed 12/29/10	Wed 12/29/10 47													
65	Pre-bid conference	1 day	Tue 1/4/11	Tue 1/4/11 64FS+3 days													
66	Trade Contractor bids due	15 days	Thu 12/30/10	Wed 1/19/11 64													
67	GMP	2 wks	Thu 1/20/11	Wed 2/2/11 66													
68	Contract Execution	0 days	Wed 2/2/11	Wed 2/2/11 67													
69	Site Permitting	50 days	Thu 9/23/10	Wed 12/1/10													
70	Prepare and submit applications to required agencies	10 days	Thu 9/23/10	Wed 10/6/10 34													
71	Public Hearings	20 days	Thu 10/7/10	Wed 11/3/10 70													
72	Issue Approval	20 days	Thu 11/4/10	Wed 12/1/10 71													
73	Construction	550 days	Wed 7/21/10	Tue 8/28/12													
122	Substantial Completion	0 days	Tue 7/3/12	Tue 7/3/12 104													
123	Furniture and Technology Installation	30 days	Wed 7/4/12	Tue 8/14/12													
124	FF&E Installation	30 days	Wed 7/4/12	Tue 8/14/12 122													
125	Educational Technology	15 days	Wed 7/18/12	Tue 8/7/12 122FS+10 days													
126	Close out	20 days	Wed 8/1/12	Tue 8/28/12 121													
127	School Dept Moves into Project	2 wks	Wed 8/8/12	Tue 8/21/12 125													
128	School Opens	0 days	Tue 8/28/12	Tue 8/28/12 127,124,125													

Task Milestone Summary

Uxbridge High School  
Date: Mon 7/19/10

**EXHIBIT D  
CASH FLOW  
TOWN OF UXBRIDGE**

**PROJECT SCOPE & BUDGET AGREEMENT**