

**100% Schematic Design
UNIFORMAT SPECIFICATIONS**

New Memorial Elementary School

**125 Winn Street
Burlington, Massachusetts**

prepared by:

KBA Architects / Knight, Bagge & Anderson, Inc.
6 Thirteenth Street
Charlestown Navy Yard
Charlestown, Massachusetts

Date of Issue:

February 28, 2009

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10 PROJECT DESCRIPTION

1010 PROJECT SUMMARY

- 1010.01 Work covered by Contract Documents: The Project consists of construction of new 78,500 square foot elementary school at 125 Winn Street, Burlington, Massachusetts. Work includes related site work, underground utilities, parking and on-site service and fire-access roadways, playgrounds, and multi-purpose playing fields. Project includes demolition of existing elementary school after Town occupancy of new project.
- 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.
- 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 365 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 Burlington 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 an elementary school, which includes pre-kindergarten, kindergarten, and elementary school grades with general-purpose spaces. Program includes standard and special subject classrooms, multi-purpose gymnasium, multipurpose 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 classroom wings adjacent to the main building. Expansion joints will be required to separate the three sections because the building has a long slender profile well over 300 ft. in length.

- The new building will be designed to resist wind and earthquake forces by utilizing moment resisting steel frames (in each direction) above the first floor.
- Reinforced masonry shear walls may also be utilized around stair locations to reduce the size of moment frame column. These masonry shear walls in general will be 8" wide.

The classroom wings will consist of a first floor level, a second floor level, and a roof level. The main building will consist of a basement level, a first floor level, a second floor and low roof level, and a high roof level. No design provisions will be implemented for future vertical or horizontal expansion.

1030.02 Design Standards

- Commonwealth of Massachusetts Building Code, 7th Edition.
- 2003 International Building Code.
- ASCE 7-02 Minimum Design Loads for Buildings and Other Structures
- ACI 318-05, Building Code and Commentary
- AISC Manual of Steel Construction (Allowable Strength Des.), 13th Edition
- SDI Design Manual of Composite Decks, Form Decks and Roof Decks, latest edition.
- Concrete Reinforcing Steel Institute, latest edition.

1030.03 Design Loads (per Commonwealth of Massachusetts Building Code, 7th 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	105 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	

SDS = .31

SD1 = .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* (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 (CO₂) 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

Construction shall occur adjacent to existing and occupied school site.

- Take all measures to insure the safety of teachers, students and the general public. The General Contractor must take every reasonable precaution and employ all necessary measures including extra cleaning, special supervisory personnel, and additional temporary barriers and signage to facilitate the clean, quiet, safe, and continual operation of the existing High School until scheduled time of decommissioning and demolition.
- Suspension of Work: The Owner retains the right to temporarily suspend work at any time when the noise or disturbance created by construction proves disruptive to the academic activities of the adjacent High School. The Owner may request of the Contractor to utilize other means and methods, if practical, and acceptable to the Architect, which are less disruptive.

Access to the site: shall be restricted to established routes for safety of students and surrounding neighborhoods. General Contractor is fully responsible to ensure that all construction workers, Filed-subcontractors, subcontractors, vendors, delivery and service companies all comply with specified access routes.

The conduct and appearance of each worker at the job site is of paramount importance.

- Access Restriction to existing school: Construction Workers are prohibited to enter the existing school without prior authorization from Owner.
- General Conduct and Demeanor: All construction workers shall treat all other workers, Owner staff, student and the public with respect and courtesy.

1060 OWNER'S WORK

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

- Testing Laboratory Services
- Interactive white boards ("Smart Board").
- Telephone/Data and communications systems.
- Security alarm and detection 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 Burlington 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 Burlington 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

Under the provisions of MGL Chapter 149, Section 44D½, the Awarding Authority will not pre-qualify applicants, nor publish a list of contractors and Filed-subcontractors eligible to bid. General Contractors and Filed-subcontractors desiring to bid on the project should apply for certification by contacting the Commonwealth of Massachusetts Division of Capital Asset Management (DCAM)

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 Advertisement to Bids.

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

- 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 \$ 23,996,000.

UNIFORMAT II LEVEL 2

PROJECT: **NEW MEMORIAL ELEMENTARY SCHOOL**

SIZE (gsf): **78,500**

LOCATION: **Burlington, Massachusetts**

ESTIMATOR: **TAC**

PLAN DATE: **Feb.13, 2009**

DIVISION	SUMMARY
A. SUBSTRUCTURE	1,081,335
B. SHELL	4,642,298
C. INTERIORS	3,538,987
D. SERVICES	5,204,275
E. EQUIPMENT and FURNISHINGS	1,177,826
F. SPECIAL CONSTRUCTION and DEMOLITION	750,000
G. BUILDING SITEWORK	1,637,785
	\$18,032,507
GENERAL CONTRACTORS BOND COST	312,894
SUBCONTRACTORS BOND COST ON 9 MILLION	163,947
GENERAL CONDITIONS 7 1/2%	1,352,438
BUILDING PERMIT	BY OWNER
LIABILITY INSURANCE	0
FEE 4 1/2%	1,705,243

ESTIMATING CONTINGENCY	7 1/2%	1,617,527
ESCALATION	3 1/2 %	811,459

SUB-TOTAL: **\$23,996,016**

COST PER GSF \$305.68

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 "dense to very dense sand to gravelly sand" material. The foundation design is based upon the Preliminary Geotechnical Report, dated December 18, 2008, and prepared by Professional Service Industries. All new footings shall be founded a minimum of 4'-0" 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'-0" by 7'-0" by 24" deep reinforced with 7 - #6's bottom each way. (Pending Final Geotechnical Report)

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.

A1050 SLABS-ON-GRADE

A1050.01 Basement Slabs: 5 inch deep concrete slab (on grade), reinforced with synthetic fibermesh, 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" 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.
- Zero-Perm by Alumiseal.

A1070 WATER AND GAS MITIGATION

A1070.01 Underslab drains: In accordance with the recommendations from the geotechnical engineer for this project, underslab drains (below the slab-on-grade) will 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"

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 II-B, the structural framing system would consist of 4" deep lightweight concrete on 2" deep by 18 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 W16x26 beams spaced at 8'-4" on center spanning 28'-0" (maximum) to structural steel girders, with an average of 1" upward camber. Structural steel girders, spanning 33'-0" (maximum) would typically be W21x62 with an average of 1" upward camber. Headed shear studs (3/4" in diameter by 5" 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 6".

In general, the typical interior columns will be 8" x 8" square tube structural steel sections supporting the second floor and roof levels. The typical exterior columns will be 7" x 7" square tube structural steel sections.

A2010.02 The overall slab/deck system would be 6 inches, with shear studs attached to the top flange of the steel beams and girders to achieve composite-action behavior.

A2030 ROOF CONSTRUCTION

A2030.01 Classroom Wing Roof Construction: The typical roof construction in the classroom wings will be structured with 3" deep by 18 gage galvanized steel roof decking spanning 8'-6" (maximum) to W16x26 structural steel beams, which span 28'-0" (maximum) to W18x40 structural steel girders. The classroom wing roof will be a gable roof and will have sloped structural steel members for drainage.

A2030.02 Main Building Roof Construction: The typical roof construction in the main building will be structured with 3" deep by 18 gage galvanized steel roof decking spanning 8'-6" (maximum) to W18x35 structural steel beams, which span 32'-6" (maximum). The low roof area over the cafeteria will utilize 40" deep long span steel bar joists spaced at 8'-6" (maximum). The high roof over the gymnasium will utilize W14x22 structural steel roof beams spaced at 7'-4" (maximum), which span 25'-0" (maximum) to structural steel roof trusses. The roof decking over the gymnasium shall be 3" deep x 18 gage galvanized steel acoustic type roof decking.

A2030.03 Canopy Construction: Framing will be 1/1/2" deep, 20 gage, Type B, galvanized metal deck supported on steel wide flange beams and girders suspended by cable supports.

A2080 STAIRS

A2080.01 Exterior Stairs: Exterior Stairs (Loading Dock): 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.

- 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.

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, including stair towers and the gymnasium, 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.

- Henry Company (formerly Bakor Inc.), 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.

- Henry Company (formerly Bakor Inc.), 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

- 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.

- 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.

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 include:

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. Acceptable manufacturers include:

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

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.

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. Acceptable manufacturers include:

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

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.

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

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 include:

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.

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.

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.

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:

Roofing System Acceptable Manufacturers:

- 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. Acceptable products include the following:

- Certainteed, product "Grand Manor Shangle".
- 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/Products:
 - 1) Atlas Roofing Corporation, Meridan MS, product "ACFoam Vented-R".
 - 2) Cornell Corporation, Cornell WI, product "Vent-Top ThermaCal 1".
 - 3) 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/Products:
 - 1) W.R. Grace Company, Cambridge MA., product "Vycor Ice & Water Shield".
 - 2) Nicolon/Mirafi Group, Norcross GA., product "Miridri WIP".
 - 3) Polyken Technologies, Division of Kendall Company, Mansfield MA., product "Polyken 640 Underlayment Membrane, Ice-O-Late".

B2010.03 Curved Roofing System: pre-coated galvanized steel standing seamed curved architectural roofing system. Work includes:

- Associated integral flashings and underlayment.
- Integral fascias.
- Related flashings and running sheet metal work, for all non-specified locations in conjunction with the roofs.
- Sealants in conjunction with metal work furnished hereunder, and plastic wedges for cap flashings terminating in reglets.

To establish a standard of quality, design and function desired, Drawings and specifications have been based on Berridge "Curved Tee-Panel" Standing Seam Roofing System.

Acceptable manufacturers include::

- Berridge Manufacturing Company, Houston, Texas.
- Englert, Inc., Perth Amboy, NJ.
- MBCI, Architectural Metal Systems Inc., Houston TX.

System includes:

- Panels: 12-3/4 inch on-center seam spacing with a seam height of 1 inch, of prefinished Hot-Dipped Galvanized - ASTM A446-85 Grade C G90 Coating A525-86 24 Gage core steel or prefinished Galvalume - ASTM 792-86.
- 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.

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 complying with requirements specified below.

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:
 - 1) Air infiltration shall not exceed 0.0 cfm per square foot of window unit surface area at 1.57 psf.
 - 2) 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:

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

C INTERIORS

C10 INTERIOR CONSTRUCTION

C1010 INTERIOR PARTITIONS

C1010.01 Metal Framed Gypsum Partitions

Non-structural steel framing members to receive gypsum board.

Ceiling and soffit suspension system.

Furnish and install gypsum board, Type X board at all locations, rated and un-rated.

- 5/8" for interior partitions on steel framing, and on exterior walls on cold formed metal framing.
- 5/8" for interior finish on metal furring on retaining foundation walls.
- 5/8" for interior ceilings on steel framing.

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.

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

C1030 INTERIOR DOORS AND GRILLES

C1030.01 Metal Doors:

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 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.

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.

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

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 indicated on Drawings.
- Face Veneer: Red Oak, Quarter Sawn.

C1090 INTERIOR SPECIALTIES

C1090.01 Lockers

metal lockers with all required closures, tops and filler pieces where shown on the Drawings, as specified herein, and as required for a complete and proper installation. Work includes, but is not limited to:

- Locker Type 1: Corridor lockers, Single tier, sloped-top metal lockers.
 - 1) Quantity 20 lockers per classroom for 22 classrooms.
- Locker Type 1: Staff lockers, Single tier, sloped-top metal lockers.
 - 1) Quantity 10 lockers for food Service.

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.
 - 1) At each wheelchair accessible toilet room, provide international handicap symbol.

C1090.03 Fire Protection 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.
 - 1) Vigilante alarm: Provide 9 volt, battery operated (battery included), plunger activated. vigilante alarm.
- Acceptable models:
 - 1) JL Industries "Embassy Series", model number 5634.
 - 2) Larsen "Occult Series", model number SS-O-2409.
 - 3) 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.

C1090.04 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.

- Levolar Corporation, Sunnyvale CA.

- MechoShade, Long Island City, NY.
- 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.

Music Classroom and 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.³ 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.

- Kemlite Company (division of Crane Company), Joliet IL., (Glasbord Products).
- Nudo Products, Inc., Springfield, IL. (Fiber-Lite Products).
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C2030 FLOORING

C2030.01 Sealed Concrete Finish:

Concrete sealers/coatings on exposed-to-view concrete floors. 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 Quarry Tile Flooring (Kitchen and Food Service Areas):

Quarry tile: nominal 6 by 6 inch by 1/2 inch thick, cushion-edges, in colors as selected by the Architect. from Manufacturer's full available range, installed thin-set over full mortar leveling coat

- Base Trim: 5 inch height by 1/2 inch thick, cove base trim, including inside and outside corners, matching field tile, and other shapes indicated or required to produce a completely finished installation.
- Quarry tile will be in a single color for any given room or contiguous space. The Architect reserves the right to more than one color for the project.

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

C2030.04 Porcelain Tile Flooring: (Corridors, as indicated):

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: 12 x 12 inch by 1/8 inch thick with pattern and color extending through thickness of tile; composed of vinyl resins, non-asbestos inorganic mineral fillers, and colorfast pigments complying with FS SS-T-312B(1), Type IV, Composition 1 and ASTM F1066 Composition 1, Class 1, Colors shall be as selected by the Architect from manufacturer's full available range. Acceptable products include:

- Armstrong World Industries, Inc., Flooring Division, Lancaster PA., product "Premium Excelon - Stonetex".
- Azrock Industries, Inc., San Antonio TX., product "Thru-Quartz".
- Tarkett, Parsippany NJ, product "Concert".

C2030.06 Rubber Flooring:

Raised-stud sheet rubber stair treads/risers and compatible flooring at landings. Acceptable Products include:

- Freudenberg Building Systems, Inc.; product Norament 825 C, Article 464/465/466/467.
- Mercer Products Company, Inc.; product "Tread-Riser Combination"
- Roppe Products Company: product 96 "Raised Circular Vantage Treads with Riser".

Raised Stud Flooring. Acceptable Products include:

- Freudenberg Building Systems Inc.; product Norament 825 C, Article 1902. Tile size: nominal 19-5/8 by 19-5/8 inches square (actual 50 cm by 50 cm).
- Endura Rubber Flooring; product "Round Standard Profile Tile". Tile size: nominal 18-1/8 by 18-1/8 inches square (actual 46 cm by 46 cm).
- Roppe Products Company: product 966 "Raised Circular Vantage 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 Platform):

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. Plywood underlayment and Resilient pads: manufacturer's standard PVC resilient pads.

C2030.08 Carpeting:

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.

Entrance Floor Mats and Frames with sub-floor filler.

- Manufacturers:
 - 1) Mats, Inc., Stoughton, MA.
 - 2) Arden Architectural Specialties, Inc., St. Paul MN.
 - 3) Balco Inc., Wichita KS.
 - 4) Construction Specialties, Inc., Muncy, PA.

C2030.09 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.

Acceptable manufacturers:

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

C2030.10 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.

C2030.11 Entry Floor tile:

Polypropylene Modular Matting Tiles: 100 percent heavy denier, solution dyed, needle punched polypropylene equal to Mats, Inc. "Slip Not 2000 Tile", 19-11/16 by 19-11/16 by 7/16 inch thick tiles, with bitumen backing, total weight 169 oz/sq yd.

Accessories:

- Adhesive for mounting bitumen backing: Equal to Mats Inc. "Release-Bond Adhesive" or as recommended by manufacturer.
- Vinyl reducer: PVC reducer transition strip as recommended by manufacturer.

C2050 CEILINGS

C2050.01 General ceilings:

Suspended acoustical tile ceiling(s) (ACT) including suspension system(s) and associated edge moldings

- Panel size: 24 by 24 inch by 3/4 inch thick.
- Panel edge: angled tegular (reveal) edge.
- 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).
- Color: White.
- Minimum light reflectance: LR 0.83.
- Acoustical characteristics:
 - 1) NRC range: 0.60 to 0.65
 - 2) CAC range: 33 to 38
- Acceptable products:
 - 1) Armstrong product "Cirrus Tegular Edge" product number 534, with HumiGuard Plus.
 - 2) Celotex product "Cashmere" with Reveal edge, product number CM-454.
 - 3) 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

- Panel size: 24 by 24 inch by 5/8 inch thick.
- Panel edge: angled tegular (reveal) edge.
- Description: ASTM E-1264, UL Fire Resistance Labeled panel, non-combustible mineral fiber board with non-directional non-perforated impervious white vinyl membrane face.
- Color: White.
- Minimum light reflectance: LR 0.79.
- Acoustical characteristics:
 - 1) CAC range: 35 to 39
- Acceptable products:
 - 1) Armstrong product "Clean Room VL HumiGuard Plus; non perforated" product number 868 (Pattern E).
 - 2) Celotex product "Vinyl Guard" product number VG-157.
 - 3) USG product "Clean Room Class100", product number 56099.

C2090 INTERIOR FINISH SCHEDULE

Refer to Drawings.

D SERVICES

D10 CONVEYING

D1010 VERTICAL CONVEYING SYSTEMS

D1010.01 Elevators

Furnish and install one holeless hydraulic 2-stop Commercial, 3000 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:	4, with two entrances at first floor
Landings:	1, 2, 3, & 4.
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 OCCUPANT SUPPORT PLUMBING SYSTEMS

D2010.01 Plumbing Description:

The plumbing systems for the new building will be entirely new and dedicated for this building. New underground services for domestic water, sanitary, grease waste, storm drain and natural

gas service will be brought into the new building. At the present time, hydrant flow test data has not been obtained for the site. Subsequently it is not possible to determine if a fire pump for the fire suppression systems and a booster pump for the domestic water systems will be required. This report assumes that the existing flow and pressure available in the site water main is sufficient to provide adequate water supplies for the fire suppression and domestic water systems without the need for booster pumps. Coordination of the available water supplies at the site is ongoing.

D2010.02 Plumbing Fixtures:

All plumbing fixtures shall be code mandated water conservation type. Water closets shall be Wall mounted fixtures with concealed carriers. Water closets shall utilize 1.6 gpf manual flush valve devices. Lavatories shall be wall mounted fixtures with concealed wall carriers and exposed piping beneath the fixture or counter mounted as applicable. Faucets for all lavatories shall be single lever mixing / metering type with 0.5 gpm operation for water conservation and anti-scald protection. All lavatory faucets shall be field adjustable to produce a maximum of 110 degrees F hot water to prevent scalding. Kitchen sinks in break room areas shall be stainless steel, counter mounted, single bowl and shall be ADA accessible in all cases. Sinks in general use areas shall be standard design with goose neck, swing spout faucets and wrist blade handles. Spray hose devices shall not be provided. Faucets for all kitchen sinks shall utilize 0.5 gpm aerators for water conservation. Sinks in all classrooms shall be classroom type design with side mounted post style mixing faucets with single wrist blade handle and shall also be provided with side mounted water bubblers. Faucets for all kitchen sinks shall utilize 0.5 gpm aerators for water conservation. Art room sinks shall be provided with solids interceptors located below the counters in order to prevent solids from art activities from being introduced into the building sanitary system. All water coolers shall be ADA compliant stainless steel finish double bowl, Hi-Low type with electric chiller. Urinals shall be wall mounted with concealed carriers and shall utilize 1.0 gpf manual flush valve devices. All shower heads shall be rated at 1.5 gpm flow for water conservation. All shower valves shall be provided with integral check stops to insure against hot water cross-over into the building cold water piping system and to provide a means for shutting off the water supplies for each individual shower fixture for maintenance. All shower valves shall be provided with adjustable temperature limit stops to insure against scalding. Locker room shower areas where multiple shower fixtures will be used shall be provided with a single master mixing valve in a locked cabinet for single source control of the hot water to the group showers. Floor drains shall be provided in all toilet rooms, locker rooms and mechanical rooms as required by code. All floor drains shall be provided with trap primer systems to prevent loss of trap seal. ADA accessible plumbing fixtures shall be located in the toilet rooms and shower rooms as required by the architectural drawings and in accordance with code. A floor outlet mop basin in a janitors closet will also be provided on each level of the building.

D2010.03 Sanitary:

The sanitary piping system shall service all of the plumbing fixtures for the building. The sanitary drains will be collected together as much as possible above the floors of the building and shall be run down through the floor levels of the building to below the floor slab in the basement level. The sanitary drains shall be collected under the floor slab, and run outside the building at a single point and connected to the site sanitary sewer. Should the lower level basement be too low for the underground sanitary to be connected to the site sewer by gravity then the sanitary for the upper floors of the building will be taken out of the building below the first floor level at multiple locations by gravity and only the underground drain piping under the basement level will be taken to a sewage ejector system and pumped up to the site sewer. All drainage systems will be taken out of the building by gravity as much as possible. The plumbers work shall terminate at a point 10'-0" beyond the building. Piping beyond 10'-0" from

the building shall be continued by the site contractor to the site sewer system. Cleanouts will be provided in the sanitary piping system in accordance with code. Cleanouts in underground piping shall be flush with the finish floor. Cleanouts in above ground piping shall be located above ceilings or within walls and shall be provided with access panels. All plumbing fixtures, traps and drains will be properly vented in accordance with the State plumbing code. Vent systems will be collected together as much as possible and continued up through the roof. Floor drains shall be provided in all toilet rooms, shower rooms and in the mechanical room. Trap primers shall be used on all floor drains. Access panels shall be provided for all trap primer valves that will be installed concealed in walls.

The kitchen shall be provided with special waste systems. A standard sanitary drain piping system will be provided for all non-grease producing kitchen equipment requiring drains and for all plumbing fixtures where grease laden waste will not be introduced. A dedicated grease waste drain piping system will be provided for all kitchen equipment requiring drains where grease will be produced and for all plumbing fixtures where grease laden waste will be introduced. Grease interceptors will be provided inside the building as required by the kitchen equipment and kitchen fixture locations. These interceptors will be recessed into the floor and shall have non-skid removable covers flush with the finish floor. All grease interceptors shall be located in readily accessible areas for cleaning and maintenance. The underground grease drain piping system shall be collected together separately from the building sanitary system and shall be run outside the building as a dedicated grease drain line. An indirect waste drain system shall also be used in the kitchen in accordance with code. All kitchen equipment requiring a drain shall be discharged into a floor drain system via code approved air gaps. In no case shall any kitchen equipment be connected directly to the building sanitary drain or grease waste drain system without the use of an approved indirect waste and air gap drain system.

D2030 BUILDING SUPPORT PLUMBING SYSTEMS

D2030.01 Storm:

The new building will be provided with a new system of roof drains and internal storm drain piping. Roof drains shall be low profile type with plastic dome strainers. The storm drains will be collected together as much as possible above the floors of the building and shall be run down through the floor levels of the building to below the floor slab in the basement level. Should the lower level basement be too low for the underground storm drain systems to be connected to the site drainage system by gravity then the storm drains for the upper floors of the building will be taken out of the building below the first floor level at multiple locations by gravity. All storm drainage systems will be taken out of the building by gravity as much as possible. The storm drains shall be collected under the first floor level and run outside the building as a dedicated storm drain line and connected to the site storm drain system. The plumbers work shall terminate at a point 10'-0" beyond the building. Piping beyond 10'-0" from the building shall be continued by the site contractor to the site storm drain system. Cleanouts will be provided in the storm drain piping system in accordance with code. Cleanouts in underground piping shall be flush with the finish floor. Cleanouts in above ground piping shall be located above ceilings or within walls and shall be provided with access panels. All horizontal storm drain piping and roof drain bodies will be insulated.

D2050 PROCESS SUPPORT PLUMBING SYSTEMS

D2050.01 Cold Water:

Cold water will be supplied via a new domestic water service that will enter the building basement mechanical room. A new water meter and isolation valves will be installed in accordance with the State plumbing code. A remote readout register will be provided in

accordance with local water authority requirements. All plumbing fixtures will be provided with cold water in accordance with State plumbing code. There will be non-freeze wall hydrants located around the new building, the non-freeze wall hydrants will be a flush mounted lock-shield type with integral vacuum breakers. Cold water hose bibbs shall be located in all toilet rooms. All cold water shall be potable. All water outlets (hose bibbs, wall hydrants) shall be provided with backflow devices to protect the potable water supply. All plumbing fixtures shall be of the water conservation type. The water closets shall be 1.6 gpf rated. The urinals shall be 1.0 gpf rated. The lavatory faucets shall be provided with 0.5 gpm flow restricting aerators. The kitchen sink faucets shall be provided with 0.5 gpm flow restricting aerators. All shower heads shall be 1.5 gpm rated. Make-up water for the HVAC equipment shall be located in the mechanical room and shall be provided with a reduced pressure backflow preventer to protect the building potable water supply from contamination. The HVAC make-up water line shall be a dedicated system that shall be isolated from the building domestic water piping system. All cold water piping and fittings shall be insulated. All cold water piping shall be labeled to indicate the service.

Cold water connections to all plumbing fixtures, kitchen equipment or other equipment requiring cold water shall be protected against cross-contamination of the building domestic water system via code approved air gaps, air breaks, integral fixture air gaps or air breaks or approved backflow prevention devices.

D2050.02 Hot Water:

Hot water will be produce via new two new domestic water heaters located in the basement mechanical room. The water heaters shall be natural gas fired. Hot water will be provided to all plumbing fixtures and kitchen equipment requiring such. Hot water will be stored in the water heaters at 140 degrees F. Each water heater will be a storage tank type unit. Intra-tank circulator pumps will be provided on each water heater to insure against stratification of the hot water within the tank and to increase the efficiency of each water heater. There will be a two temperature hot water system utilized for the building domestic hot water needs.

The first temperature system will be at 140 degree F and shall be a dedicated piping system for the kitchen areas only. All kitchen equipment and fixtures used for washing pots, pans, utensils, trays and other items used for the preparation and dispensing of food shall be connected to this dedicated 140 degree F hot water piping system. The dishwashing machine shall be provided with a point of use hot water booster that will raise the water temperature used by the dishwashing machine to 180 degrees F for sterilization purposes. All hand washing sinks in the kitchen that are not used for food preparation or dispensing shall be provided with a mixing valve located under the sink to insure against scalding. This 140 degree F hot water supply piping system shall be provided with a dedicated circulating loop. A hot water circulation pump shall be provided at the water heaters in the mechanical room in order to maintain the water temperature in the piping system. All of the water piping and fittings in this supply and return loop system shall be insulated. All of the water piping in this supply and return loop system shall be labeled to indicate the water temperature of the piping system and to indicate if the piping is a supply or return line.

The second temperature system will be at 120 degrees F and shall be a dedicated piping system for all hot water plumbing fixtures throughout the building other than in the kitchen area. A central mixing valve will be provided at the water heaters in the mechanical room to temper the hot water in this system to 120 degrees F for the building general use plumbing fixtures. This 120 degree F hot water supply piping system shall be provided with a dedicated circulating loop. A hot water circulation pump shall be provided at the water heaters in the mechanical room in order to maintain the water temperature in the piping system. All of the water piping and fittings in this supply and return loop system shall be insulated. All of the water piping in

this supply and return loop system shall be labeled to indicate the water temperature of the piping system and to indicate if the piping is a supply or return line.

All lavatory faucets shall be a mixing type and shall be adjusted to produce a maximum of 110 degrees hot water to prevent scalding. The shower rooms in the gymnasium shall be provided with a central mixing valve to insure that the hot water to the shower room fixtures can be regulated to prevent against scalding. This central mixing valve shall be located in an accessible area and shall be within a wall recessed, lockable cabinet for teacher access only.

D2050.03 Natural Gas:

A new natural gas service will be provided to the building. Coordination with the local gas utility company will be performed to insure that the existing site gas system will be of adequate capacity and pressure to supply the building natural gas demands. Coordination with the local gas utility company will also be done to verify that the new gas service to the building will be provided by the gas company with no backcharges to the school. While it is typical for the gas utility company to provide this underground service without these backcharges this verification will be determined once the project is presented to the gas company with a list of proposed gas loads for the building.

Natural gas will be provided to the building via a dedicated gas piping system. A central gas meter will be located outside the building at the point where the underground gas service is brought up to the building. The natural gas system within the building will be a low pressure system.

Gas will be provided to all HVAC equipment requiring such and to the domestic water heaters. All gas fired equipment requiring vented gas trains shall be provided with dedicated gas train vent piping that will be carried up through the building and terminated above the roof in accordance with code.

Gas will be provided to the kitchen for all gas fired kitchen equipment. The kitchen gas piping system will be provided with a central automatic isolation valve that will be connected to the kitchen exhaust hood fire suppression systems. In the event of a fire at any of the kitchen equipment the isolation valve will automatically shut off thus terminating the gas supply to the kitchen.

All gas piping will be provided with seismic bracing as required by code. All gas piping will be labeled to indicate service. All gas piping exposed to the outside will be painted with a corrosion resistant coating.

D30 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

D3010 COMBINED HEATING AND COOLING SYSTEMS

D3010.01 Description:

A new mechanical room shall be located in the lower level of the building. The mechanical room shall house three new gas fired, cast iron sectional boilers; each sized for one-half of the new heating loads. From the boilers, a hot water distribution piping system shall transport heating water to the hot distribution water piping system. The hot water lead/standby base mounted circulated pumps to new heating systems throughout the building. The hot water distribution piping system will utilize variable frequency drives vary the speed of the water circulating pumps based on differential pressure setpoint. The heating and cooling systems shall also include combustion air provisions, water specialties and automatic temperature

controls. The hot water system will be provided with 30 percent propylene glycol solution for burst protection of the hot water heating system.

The Administration Area, Computer Classroom and interior classrooms will be provided with heating, ventilating and air conditioning from a hot water heating/DX cooling rooftop unit. Each zone will be provided with variable air volume/fan mixing box terminal units for individual heating/cooling zones. The rooftop unit will operate its heating, cooling and economizer controls to provide conditioned supply air, at the supply air temperature necessary to provide cooling to the "worst case" zone, through a medium pressure supply air duct distribution system to each terminal unit. Each terminal unit shall operate its variable air volume and reheat controls as required to maintain the individual space temperature setpoint of each zone. The supply air duct distribution system from the terminal unit to the air outlets will be low pressure. The ceiling space within each zone will be used as a return air plenum with a return duct distribution system from the zone ceiling plenum to the rooftop unit. Each zone will be provided with a space sensor which will control the terminal unit airflow and the reheat coil two way control valve. Unit will be provided with a hot water heating coil interconnected to the heating hot water distribution piping system and variable speed drives for the supply fan and return fan motors. Rooftop unit will be provided with sound attenuators in the supply air and return air duct systems. Each terminal unit will be provided with a sound attenuator.

D3010.02 Classrooms, Group Rooms and Corridors:

Classrooms, Group Rooms and Corridors shall be provided with fin-tube radiation for heating of the space; conditioned ventilation which will also provide a level of air conditioning and dehumidification to the space shall be provided from two packaged heat recovery units with hot water heating and DX cooling located on the roof. The conditioned ventilation shall be ducted from the heat recovery unit to each space terminating at ceiling supply diffusers in quantities sufficient to fulfill applicable code requirements. Each supply duct to the individual space will be provided with a motor operated damper for space temperature, CO₂ and occupancy control. An insulated exhaust air duct system will be required from each space to maintain a neutral pressure back through the heat recovery unit on the flat roof. Each unit will be provided with a hot water heating coil interconnected to the heating hot water distribution piping system and variable speed drives for the supply fan, exhaust fan and heat recovery wheel motors. The heat recovery unit which will act to recover 75 percent of the energy to heat/cool the ventilation air from the exhaust air. Each space would be provided with a wall mounted sensor for space temperature control, CO₂ sensor and interconnected to the lighting system occupancy sensor for space occupancy control. Heat Recovery units will be provided with sound attenuators in the supply air and return air duct systems.

D3010.03 Library:

The Library will be provided with heating, ventilation and air conditioning from a hot water heating/DX cooling rooftop unit located on the roof. A new medium pressure supply air duct system shall provide primary air to each of the four zones in the library. Each library zone will be provided with a variable air volume/fan mixing box terminal units for individual heating/cooling zones. New low pressure supply air duct systems shall distribute air from the terminal box above the ceiling and terminate at supply diffusers; return air shall enter into return registers at the floor level into a new low pressure return duct distribution system back to the rooftop unit where the air either returns air to unit or exhausts air to the outdoors through the motor operated dampers based on ventilation control as determined by the zone CO₂ sensor in return/exhaust ductwork or enthalpy controlled economizer. Unit will be provided with a hot water heating coil interconnected to the heating hot water distribution piping system and variable speed drives for the supply fan and return fan motors. Rooftop unit will be provided with sound attenuators in the supply air and return air duct systems, all ductwork serving the

library will be internally lined with an acoustical lining and each terminal unit will be provided with a sound attenuator.

D3010.04 Cafeteria:

The Cafeteria will be provided with heating, ventilation and air conditioning from hot water heating/DX cooling heat recovery unit located on the roof. New low pressure supply air duct systems shall distribute air above the ceiling and terminate at supply diffusers; return air shall enter into ceiling return registers into a new low pressure return duct distribution system back to the rooftop unit where the air either returns air to unit or exhausts air to the outdoors through the motor operated dampers based on ventilation control as determined by CO2 sensor in return/exhaust ductwork or enthalpy controlled economizer. Heat recovery unit will be provided with a hot water heating coil interconnected to the heating hot water distribution piping system and variable speed drives for the supply fan, exhaust fan and heat recovery wheel motors. Rooftop unit will be provided with sound attenuators in the supply air and return air duct systems.

D3010.05 Kitchen/Servery:

The Kitchen/Servery will be provided with heating, ventilating and air conditioning from a hot water heating/DX cooling rooftop unit, an insulated low pressure supply air and an insulated return air duct distribution systems. Supply air volume shall be designed for 70% of the kitchen hood exhaust system capacity. The kitchen hoods new grease duct system and an U.L. listed upblast exhaust fan(s). The dishwasher shall be provided with a stainless steel dishwasher exhaust duct system and an U.L. listed upblast exhaust fan(s) for the dishwasher hood. A new general exhaust fan shall be provided to ventilate the space when the dishwasher and kitchen hood exhaust systems are deenergized. The Kitchen rooftop unit, general exhaust fan, dishwasher exhaust fan and kitchen exhaust fan shall be interlocked to maintain a negative pressure in the kitchen area.

D3010.06 Gymnasium:

The Gymnasium will be provided with heating, ventilation and air conditioning from hot water heating/DX cooling heat recovery unit located on the roof. The units shall provide conditioned ventilation air to the space through a system of supply air ductwork at the upper levels of the space and drum louvers for air distribution down to the floor level; air shall be returned to the unit from return registers located near the floor level into a return duct distribution system back to the heat recovery unit. The units shall be provided with ventilation control through the use of a CO2 sensor mounted in the return duct to vary the outside, return and exhaust air dampers for actual space occupancy. Heat recovery unit will be provided with a hot water heating coil interconnected to the heating hot water distribution piping system and variable speed drives for the supply fan, exhaust fan and heat recovery wheel motors. Heat recovery unit shall be provided with sound attenuators in the supply air and return air duct systems.

D3010.07 Entryways:

Each entry will be provided with a hot water cabinet unit heater. The cabinet unit heater supply fan operation will be controlled by the unit's integral thermostat.

D3010.08 Sprinkler Room:

The sprinkler room will be provided with an electric unit heater with an integral thermostat for heating and code required exhaust from one of the building exhaust systems.

D3010.09 Data Closet:

The data closet shall be provided with a split system air conditioning system consisting of an indoor evaporator unit and an outdoor air-cooled condensing unit located on the roof to maintain the space temperature requirements of the electronics located in the closet.

D3010.10 Electric Room:

The electric room will be provided with an electric unit heater with an integral thermostat for heating and code required exhaust from one of the building exhaust systems. If necessary, the electric room will be provided with a heat dissipation system to accommodate heat gains from transformers, etc.

D3010.11 Elevator Machine Room:

Elevator Machine Room shall be provided with a split system air conditioning system consisting of an indoor evaporator unit and an outdoor air-cooled condensing unit located on the roof to maintain the space temperature requirements of the electronics located in the closet; and vented into shaft in accordance with applicable codes.

D3010.12 Toilets:

Each toilet will be provided with exhaust through ceiling mounted exhaust register(s) to provide 75 cfm/fixture of exhaust from the space by roof mounted exhaust fans through a low pressure duct distribution system. Each exhaust fan will operate continuously during occupied hours and be deenergized during unoccupied hours. Heating shall be provided by fin tube radiation.

D3010.13 Miscellaneous Spaces:

Miscellaneous spaces, such as storage rooms, shall be provided with hot water heating, where required, and an exhaust air system in accordance with applicable code requirements.

D3010.14 Automatic Temperature Controls:

All automatic temperature controls shall be direct digital control (DDC).

D40 FIRE PROTECTION

D4010 FIRE ALARM AND DETECTION SYSTEMS

D4010.01 Description:

A new fire alarm control panel shall be located in the main electric room. Fire Alarm devices shall be installed in accordance with NFPA 72, Life safety 101 and ADA as well as Burlington Fire Department requirements. In general, pull stations will be provided at all exit doors within 5'-0", visual alarms will be provided in all classrooms, conference rooms, common areas, corridors, mechanical rooms, labs, and toilet rooms. Audio alarms will be provided in all mechanical rooms, labs, classrooms, common areas and corridors.

A pull station will be provided on the stage, if lighting control equipment is provided, and at all exits from the auditorium.

Smoke detectors shall be installed in all corridors on 30' centers, in storage closets, in the elevator machine room and at the top all stairwells. A smoke detector provided at all elevator lobbies, for elevator recall functions.

A heat detector shall also be located in the elevator machine room and kitchen. The ansul system will be connected to the fire alarm control panel for annunciation purposes. The sprinkler system shall also be connected to the fire alarm control panel, via the tamper and flow switches.

A rotating red beacon shall be provided on the building exterior indicating the location of the Masterbox. The fire alarm system shall be connected to the Burlington Fire Department via recessed Masterbox over I.M.S.A. cable installed in a 2" underground conduit.

D4030 FIRE SUPPRESSION SYSTEMS

D4030.01 Description:

The fire protection systems for the new building will be entirely new and dedicated for this building. A new underground fire protection service will be brought into the new building. At the present time, hydrant flow test data has not been obtained for the site. Subsequently it is not possible to determine if a fire pump for the fire suppression systems and a booster pump for the domestic water systems will be required. This report assumes that the existing flow and pressure available in the site water main is sufficient to provide adequate water supplies for the fire suppression and domestic water systems without the need for booster pumps. Coordination of the available water supplies at the site is ongoing.

The new building will be provided with a new fire sprinkler and standpipe system. The fire sprinkler systems will provide coverage for 100% of the building interior spaces. A new fire protection main will be brought onto the site and into the dedicated sprinkler room. A double check backflow preventer will be provided at the fire main entrance into the sprinkler room. A wet system alarm check valve and trim with dedicated sprinkler / standpipe riser will be provided in accordance with NFPA for every 52,000 square feet of building area. A fire department connection will be provided outside of the sprinkler room and in an area readily accessible to fire department vehicles. The exact location and quantity of the fire department connections will be coordinated with the local fire department authority. An audible sprinkler system alarm bell will be located on the outside wall adjacent to each fire department connection.

D4030.02 Fire Sprinkler System:

The building sprinkler system will be broken into zones. Each floor of the building will be on a separate zone with its own isolation valve and flow switch. The gymnasium sprinkler system will be supplied from that floor levels sprinkler zone, and will be provided with a separate isolation valve and flow switch. The building zones will be supplied via a combination standpipe/sprinkler riser system. The combination standpipe / riser will be located in one of the required egress stairways. There will be a 2 1/2" fire department hose valve with a 1 1/2" reducing hose connection on each floor landing in the stairway. In addition to the main combination standpipe / sprinkler riser there will be separate standpipe risers located in each of the remaining egress stairways of the building. These standpipes will also be provided with a 2 1/2" fire department hose valve with a 1 1/2" reducing hose connection on each floor landing in the stairway. In addition to these standpipes, individual fire department hose valves as described above will be located within the building on each sides of fire doors in the egress corridors as required by code. These individual fire department hose valves will be located within recessed wall cabinets. Each of the standpipe/sprinkler and dedicated standpipe risers

will be provided with its own isolation valve in order to isolate individual standpipe/risers and standpipes without shutting down the entire building fire suppression system. All of the standpipe/sprinkler and standpipe risers will have the ability to be charged through the fire department connection. The standpipe and sprinkler systems will be designed and hydraulically calculated per NFPA-13 and NFPA-14.

The sprinkler systems for the building will be automatic, wet pipe systems that will provide coverage for 100% of the new building interior spaces. Each floor of the building will be on a separate zone with its own isolation valve and flow switch. A zone control valve and flow switch will be located on each floor on the standpipe/sprinkler risers. Each flow switch for each zone will be provided with a test and drain valve and drain riser in order to test the flow switches. Remote test and drain valves will be located on the remote ends of each sprinkler system zone. All sprinkler heads will be listed quick response heads with 1/2 inch orifice. The sprinkler heads will be ordinary temperature general building areas. High temperature sprinkler heads will be provided for in electrical rooms, mechanical rooms, kitchen cooking areas, and for the gymnasium. Sprinkler heads in all finished ceiling areas will be recessed pendant type. Sprinkler heads in all unfinished ceiling areas will be upright type. Sprinkler heads located in the gymnasium shall be provided with wire cage guards. A spare sprinkler head cabinet will be located next to the alarm check valves.

All fire sprinkler systems will be designed, installed and tested in accordance with NFPA-13, NFPA-14, NFPA-24 and the State Building Code. All sprinkler heads, piping, fittings, devices, valves and all materials associated with the fire sprinkler systems shall be UL listed and / or FM approved for fire protection systems and shall be rated at 175 psi working pressure. All isolation valves shall be electronically supervised. A lockable key box or "knox box" will be provided at the entrance to the new building. This box will be approved by the Fire Department prior to installation by the sprinkler contractor. All sprinkler systems will be seismically braced in accordance with the State Building Code and NFPA-13.

All fire sprinkler systems shall be designed, installed and tested by a fire protection contractor licensed and experienced in the state for fire protection systems. All fire sprinkler systems and standpipe systems will be hydraulically calculated per NFPA-13 and NFPA-14. A complete set of working sprinkler and standpipe drawings and hydraulic calculations detailing all aspects of the fire protection systems shall be produced and submitted to the Fire department for approval prior to the commencement of any fire protection work. These working drawings and hydraulic calculations will be stamped and signed by the fire protection contractors registered engineer and submitted to the Fire Department for final approval. No fire protection work shall commence until the Fire Department has approved the fire protection contractors stamped drawings and hydraulic calculations.

D4030.03 Standpipe System:

The Standpipe systems will be hydraulically calculated per NFPA-14. The sprinkler systems shall be calculated as follows:

General building areas, classrooms and the gymnasium will be calculated as a light hazard occupancy with .10 gpm per remote 1500 square feet and 100 gpm hose stream allowance.

Mechanical rooms will be calculated as an ordinary hazard occupancy group 2 with .20 gpm per remote 1500 square feet and 250 gpm hose stream allowance.

Cafeteria seating areas will be calculated as a light hazard occupancy with .10 gpm per remote 1500 square feet and 100 gpm hose stream allowance.

Kitchen areas will be calculated as an ordinary hazard occupancy group 1 with .15 gpm per remote 1500 square feet and 250 gpm hose stream allowance.

Stages will be calculated as an ordinary hazard occupancy group 1 with .15 gpm per remote 1500 square feet and 250 gpm hose stream allowance

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE AND DISTRIBUTION

D5010.01 Normal Power:

The main power for this project shall be provided via an NSTAR provided pad mounted transformer located on the exterior of the building. This transformer will be connected to the utility with a primary underground ductbank to a pole located on Winn St. The building will be connected to the transformer via an underground ductbank to the main electric room. The main service for this room shall be based on actual loads of which approximately 50% will be based on the mechanical systems selected. The approximate size of the service shall be a 1200A, 480/277V, 3 Phase, 4 Wire switchboard.

The main power distribution shall be set up with smaller electrical closets located at each wing of each floor of the building. Each room shall be supplied with dry type transformers to provide power to smaller mechanical equipment, incandescent lighting and all general and computer receptacles. All lighting shall be connected at 277V through a new lighting control panel (as required by code). Utilization of 277V for lighting will save on conduit runs, conductors and required circuit breakers. Mechanical power panel shall be located based on the systems selected. All large mechanical equipment shall be connected at 480V, 3 Phase.

Classrooms shall be provided with a minimum of 6 receptacles for computers and 6 general-purpose outlets will be provided. (3) 20A circuits for the computers and (2) 20A circuits for the remainder of the general-purpose outlets. A minimum of (4) 4x4 junction boxes with pull wire to above hung ceilings shall be provided for communications outlets. The science classrooms shall have power and data under the work desks.

Offices and conference rooms shall be provided with (1) outlet per wall and (1) 4x4 junction box for communications at the desk location.

The Gym Shall be provided with general purpose receptacles on each wall and power for equipment such as scoreboards, motorized equipment, and other miscellaneous equipment. Communication device locations shall be provided for scoreboard and timeclocks.

The Library shall have outlets as required for computer areas, offices, table lamps and general purpose. Data device locations shall also be provided for the computer area and offices. Telephone locations shall be for office/desk area only.

The Cafeteria/Assembly Room shall be provided with general purpose outlets and one data drop location.

The Kitchen shall be provided with a separate panelboard. The panel shall be shunt trip type for any equipment under hoods or other equipment required by code. The other shall be for all other equipment. Devices shall be provided for equipment and all general purpose outlets shall be ground fault protected as required by code. The kitchen office shall be provided with general purpose and data locations as well as a phone location.

The Auditorium shall be provided with a platform.

Mechanical Spaces shall be provided with receptacles on every wall at 4'-0" AFF. All outlets shall be GFI protected.

Each toilet room shall be provided with a GFI type receptacle.

D5010.02 Emergency Power:

The building shall be provided with an emergency generator. This generator shall be sized based on required load but shall be approximately 100KW, 480/277V, 3 Phase, 4 Wire. Connected to the generator shall be emergency lighting, exit signs, fire alarm telephone service, security panel, additional code required loads and any required mechanical equipment for freeze protection. Owner-requested loads will be included on the generator. A detailed list will be required during preliminary design. Two transfer switches will be required. The life safety switch and distribution will require a (2) hr fire rated room. The standby equipment transfer switch and distribution will be located with the normal power systems.

D5040 LIGHTING

D5040.01 Description:

Classrooms shall be provided with direct/indirect suspended fluorescent fixtures. The fixtures shall be provided in continuous rows located approximately 10' on center. The lighting controls shall allow for the dual level lighting.

Offices and Conference rooms shall be provided with fluorescent 2x2 and 2x4 recessed direct/indirect lighting fixtures. Dual level switching shall be provided.

Corridors shall be provided with 2x2 indirect recessed fixtures, wall washers and downlights. All corridor switches shall be accomplished via ceiling mounted occupancy sensors.

The Gym Shall be provided with glass fluorescent high bay fixtures. These fixtures shall be fully enclosed and provided with wire guards. Controls shall be local key type switches.

The Library shall be provided with recessed indirect fluorescent general lighting fixtures and dual level lighting control with local switches. Specialty lighting shall be provided to emphasize special details or areas.

The Cafeteria/Assembly Room shall be provided with fluorescent fixtures selected for the ceiling types. The controls shall be via occupancy sensors with local override wall switches..

The Kitchen shall be provided with gasketed recessed fluorescent acrylic lensed fixtures. These shall be recessed. The controls shall be via local wall switches.

Utility rooms and small storage areas will be provided with industrial fluorescent strips with electronic ballasts and wire guards. Switching shall be through wall switches.

The mechanical room shall be provided with industrial fluorescent strips with electronic ballasts and wire guards. Switching shall be through local control.

Stairs shall be provided with wall mounted fluorescent direct/indirect. Switching shall be via occupancy sensors.

Toilets shall be provided with 2x2 lensed fluorescent fixtures locally switched.

1) Emergency lighting shall be accomplished with the emergency distribution system. One classroom lighting fixture and all paths of egress will be illuminated as required by code. Exit signs shall also be connected to the generator and shall adequately direct all occupants to the exits. Auditorium lighting will be connected to the fire alarm system such that during a fire alarm full lighting will be on in the auditorium.

D5080 OTHER ELECTRICAL SYSTEMS

D5080.01 Clocks:

Furnish and install individual room clocks with remote control system.

Clocks: Semi-flush mounted 25-5/16 inch diameter by 3 inch deep 115 volt, 60 hertz electric clock equal to, Electric Time Company, Inc., Style 552924, Patriot Style F, black on off white dial with black hands and orange sweep second hand.

- Clock face: Type O.
- Hand style: MS-A.

D60 COMMUNICATIONS

D6010 DATA COMMUNICATIONS SYSTEMS

D6010.01 Description

(2) 4" conduits shall be provided from the main communications closet to a utility pole on Winn St. The conduit shall run underground via a ductbank. The main communication closet shall be supplied with plywood backboards for the installation of equipment provided by the utility and owner. Dedicated receptacles will be provided for equipment and the room will be air conditioned to maintain temperature. Smaller closets will be provided based on the floor plan layout. Maximum distance between any data device and a closet is 295 lf of cable. 4" conduits will be provided between the main communication and smaller closets.

Clocks, Paging and bell systems: The EC shall provide conduit, boxes and pull wires to the communication closets to be connected to the owner provided systems.

Empty conduits and boxes with pull wires shall be provided for data and telephone locations.

Boxes will be provided in the auditorium floor with conduits to one side of the stage. A box shall also be provided at the front of the stage, in the middle of the auditorium and at the back for possible microphone locations.

E EQUIPMENT AND FURNISHINGS

E10 EQUIPMENT

E1030 COMMERCIAL EQUIPMENT

E1030.01 Foodservice Equipment

As subsequently specified.

E1060 RESIDENTIAL EQUIPMENT

E1060.01 Residential Appliances

Provide residential appliances, including the following:

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

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.
- Conference Room credenza.
- Work room cabinets and mail slots.
- Classroom cabinets.
- Custom fabricated wood storage cubicles at Pre-K and Kindergarten classrooms.
- 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:

- Hussey Seating Company, North Berwick ME.
- Folding Bleachers Company, Effingham IL
- Interkal Inc., Kalamazoo, MI, telephone (616)-349-1521.

F SPECIAL CONSTRUCTION AND DECONSTRUCTION

F10 SPECIAL CONSTRUCTION

F1060 ATHLETIC AND RECREATIONAL SPECIAL CONSTRUCTION

F1060.01 Backstops:

Furnish and install 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.

F1060.02 Gym Dividers:

Furnish and install 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.
- Curtain:
 - 1) 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
 - 2) Upper curtain: White vinyl coated polyester mesh approximately 50 percent open weave and weighing 9 ounces per square yard,.

F1060.03 Gymnasium Equipment

Furnish and install the following gymnasium equipment:

- Wall padding. 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.
 - 1) Corner wall pad: Prefabricated L-shaped foam corner pads 6 inches by 6 inches by 6 feet tall, thickness matching adjacent wall panels

- Folding mats: 1-1/4 inch thick prefabricated non-tear vinyl laminated mats with Velcro mounting.
- Electric mat hoists. Stationary factory wired, preset, programmable overhead supported mat hoist, with independent steel frame sub-assemblies
- Volleyball system
 - 1) 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 NFSHSA recommendations:
 - 2) Mounting: 3-1/2" diameter floor sleeves, flush mounted into flooring system.

F20 FACULTY REMEDIATION

F2010 HAZARDOUS MATERIALS REMEDIATION

F2010.01 Hazardous Materials:

There are accessible and inaccessible asbestos containing materials (ACM) in the existing building. ACM affected by the Demolition project are to be included under this contract. The Demolition Contractor shall provide proper procedures regarding removal and disposal of Damproofing, flashing, roofing material and transite pipes, and shall comply with all federal, state and OSHA regulations.

F30 DEMOLITION

F3010 STRUCTURE DEMOLITION

F3010.01 Demolish clearing, removal and legal disposal of existing elementary school after completion and commissioning of new school structure. Work shall be completed to minimize interference with adjacent new construction and occupied building areas, in compliance with governing laws and buildings, with prime consideration given to the safety, protection and convenience, students, the general public and Owner's personnel. Demolition work includes:

- Provide, erect and maintain temporary barriers as required to protect non-construction related pedestrian and vehicular traffic using the adjacent portions of the site.
- Removal of unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings and equipment.
- Removal of underground tanks and piping
- Salvage removed indicated materials for re-use as designated by Owner.

G SITEWORK

G10 SITE PREPARATION

G1010 EARTHWORK

Refer to Drawings.

G20 SITE IMPROVEMENTS

G2010 PLAYFIELD STRUCTURES

G2010.01 Play field equipment and structures: Refer to Drawings.

G30 SITE LIQUID AND GAS SITE UTILITIES

Refer to Drawings.

G40 ELECTRICAL SITE IMPROVEMENTS

Refer to Drawings.

G50 SITE COMMUNICATIONS

Refer to Drawings.

G90 OTHER SITE CONSTRUCTION

Refer to Drawings.