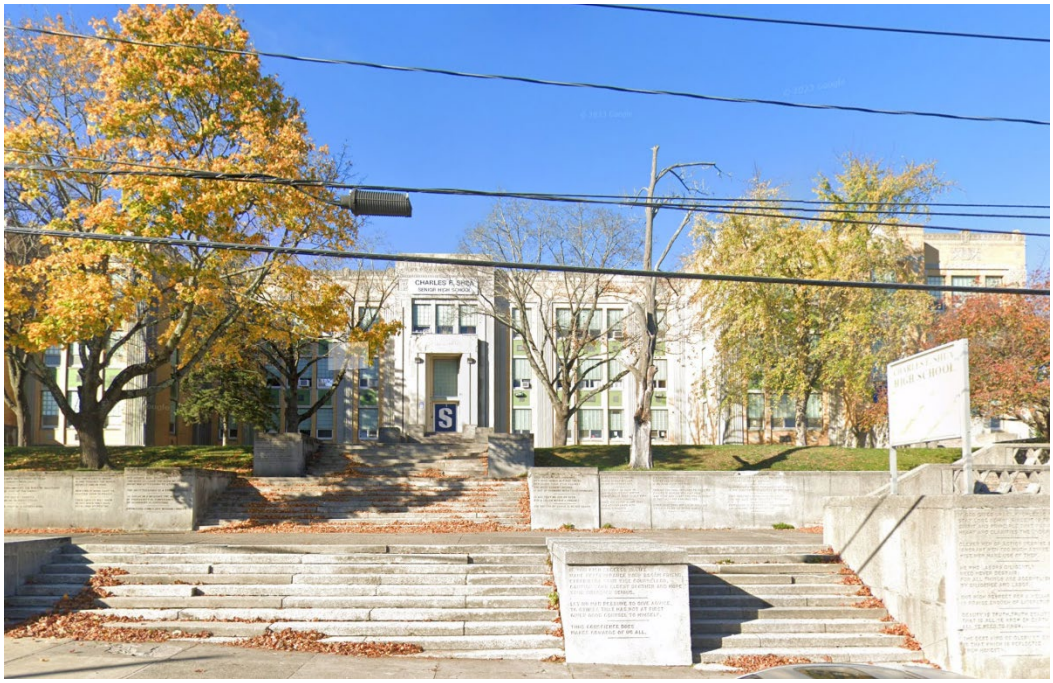
Charles E. Shea High School
LIFE SAFETY UPGRADES

PROJECT MANUAL of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

Project Address: 485 East Ave, Pawtucket RI 02860
Project Ref: #2422
Issued For: 60%CD RIDE SBA REVIEW
Printed: 12/4/2024



11 Aleppo St
Providence RI 02909
401.400.ARCH

Signal Works Architecture

SECTION 00 0110

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DIVISION 12 – FURNISHINGS

NOT USED

DIVISION 21 – FIRE PROTECTION

21 1300 – AUTOMATIC SPRINKLER SYSTEMS

DIVISION 22 – PLUMBING

NOT USED

DIVISION 23 – HVAC

NOT USED

DIVISION 26 – ELECTRICAL

NOT USED

DIVISION 27 – COMMUNICATIONS

NOT USED

DIVISION 28 – ELECTRONIC SAFETY & SECURITY

NOT USED

DIVISION 30 – SITE FURNISHINGS

NOT USED

DIVISION 31 – EARTHWORK

NOT USED

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 9433 – CONCRETE PLANTER

DIVISION 33 – UTILITIES

NOT USED

END OF SECTION

SECTION 00 0115
LIST OF DRAWINGS

DWG #:	TITLE:	DATE:
FRONT END		
C-0.1	COVER PAGE	12/04/2024
FIRE PROTECTION		
FP-0.1	FIRE PROTECTION NOTES, SYMBOLS & DETAILS	12/04/2024
FP-B.1	BASEMENT (PARTIAL) FIRE PROTECTION PLAN	12/04/2024
FP-1.1	FIRST FLOOR FIRE PROTECTION PLAN	12/04/2024
FP-2.1	SECOND FLOOR FIRE PROTECTION PLAN	12/04/2024
FP-3.1	THIRD FLOOR FIRE PROTECTION PLAN	12/04/2024
ARCHITECURAL		
A0.0	SYMBOLS, NOTES & BUILDING INFORMATION	12/04/2024
D1.0	EXISTING / DEMO BASEMENT PLAN	12/04/2024
D1.1	ENLARGED DEMO PLANS	12/04/2024
A1.0	PROPOSED KEY PLAN	12/04/2024
A1.1	PROPOSED ENLARGED EXTERIOR STAIR PLANS	12/04/2024
A1.2	PROPOSED ENLARGED EXTERIOR STAIR PLANS	12/04/2024
A1.3	PROPOSED ENLARGED EXTERIOR STAIR PLANS	12/04/2024
A1.4	PROPOSED ENLARGED INTERIOR PLANS	12/04/2024
A3.1	EXTERIOR STAIR ELEVATIONS	12/04/2024
A5.1	DETAIL DRAWINGS	12/04/2024
A5.2	DETAIL DRAWINGS	12/04/2024
A6.0	DOOR SCHEDULE	12/04/2024

END OF SECTION

SECTION 00 6700
PREVAILING WAGE RATES

Prevailing Wage is the cost per hour, for labor wages set by law, involving construction work for various and related trades. It involves a bidding process for contractors that will use federal, state or municipal monies (tax payer dollars) for work on projects that will be used for the public, by the public.

The successful contractor and sub-contractor shall comply with the provisions of Rhode Island General Laws (RIGL) Chapter 37 pertaining to the "Prevailing Wage Laws" for all municipal funded projects in excess of one thousand ($1,000) dollars. The RI Department of Labor has accepted the prevailing wage rates as determined by the Federal Wage and Hour Division under the Davis-Bacon Act. A copy of the most current wage decision pertaining to this bid is available from the Director of Labor at 457-1860 or on the web site: www.dlt.ri.gov/pw.

As required under RIGL 37-13-13, the successful contractor must certify and submit weekly payroll forms to the Finance Director's Office.

END OF DOCUMENT

DOCUMENT 00 7200
GENERAL CONDITIONS

1. General Conditions: AIA A201, General Conditions of the Contract for Construction.

2. General Conditions: AIA A271, General Conditions of the Contract for Furniture, Furnishings and Equipment.

3. General Conditions Forms: General Conditions are available from the American Institute of Architects, Washington, D.C., 202-626-7300. General Conditions will be prepared and approved for use on the project by the Owner in consultation with an attorney.

END OF DOCUMENT

DOCUMENT 00 73 00
SUPPLEMENTARY CONDITIONS

1. Supplementary Conditions: Supplementary Conditions will be prepared and approved for use on the project by the Owner in consultation with an attorney.

END OF DOCUMENT

SECTION 00 7400

MINORITY BUSINESS ENTERPRISE REQUIREMENTS AND WOMEN BUSINESS ENTERPRISE REQUIREMENT

The bidder will endeavor to obtain a minimum of ten (15%) of the awarded amount to minority business subcontractors and/or suppliers certified by the **State of Rhode Island**.

PART 1 This offer of minority participation will be considered a factor in the contract award

PART 2 The successful bidder shall substantiate this participation within ten (10) days after receipt of Notice of Award. The bidder will endeavor to obtain a minimum of fifteen (15%) of the awarded amount to women business subcontractors and/or suppliers certified by the **State of Rhode Island**.

Under Rhode Island General Laws §37-14.1, Minority business enterprises shall be included in all procurements and construction projects under this chapter and shall be awarded a minimum of fifteen percent (15%) of the dollar value of the entire procurement or project. Of that fifteen percent (15%), minority business enterprises owned and controlled by a minority owner, shall be awarded a minimum of seven and one-half percent (7.5%), and minority business enterprises owned and controlled by a woman shall be awarded a minimum of seven and one-half percent (7.5%).

PART 3

- This offer of minority participation will be considered a factor in the contract award and RIDE Reimbursement

- The successful bidder shall substantiate this participation within ten (10) days after receipt of Notice of Award.

END OF DOCUMENT

SECTION 01 11 15

VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS

1.0 GENERAL

1.1 Summary

A. The specification section includes requirements for volatile organic compound (VOC) content in adhesives, sealants, paints and coatings used for this project.

1.2 General Requirements

A. The Contractor is required to implement practices and procedures to meet the project's environmental goals, which include achieving NE-CHPS criteria. Specific project goals which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor shall ensure that the requirements related to these goals, as defined in the sections below and in the related sections of the Contract Documents, are implemented to the fullest extent feasible.

1.3 References

A. Rule 1168 – "Adhesive and Sealant Applications," amended January 7, 2005: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

B. Rule 1113 – "Architectural Coatings," amended July 9, 2004: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

C. Green Seal Standard GS-11 – "Paints," of Green Seal, Inc., Washington, DC, www.greenseal.org

D. Green Seal Standard GC-03 – "Anti-Corrosive Paints," of Green Seal, Inc., Washington, DC, www.greenseal.org

1.4 VOC Requirements for Interior Adhesives

A. The volatile organic compound (VOC) content of adhesives, adhesive bonding primers or adhesive primers used in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications."

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

1.5 General

A. Unless otherwise specified below, the VOC content of all adhesive, adhesive bonding primers and adhesive primers are to be in excess of 250 grams per liter.

B. For specified building construction related applications, allowable VOC content is as follows:

1. Architectural Applications

a.	Indoor carpet adhesive	50
b.	Carpet pad adhesive	50
c.	Wood floor adhesive	100
d.	Rubber floor adhesive	60
e.	Subfloor adhesive	50

f.	Ceramic tile adhesive	65
g.	VCT and asphalt tile adhesive	50
h.	Drywall and panel adhesive	50
i.	Cove base adhesive	50
j.	Multipurpose construction adhesive	70
k.	Structural glazing adhesive	100

1.6 VOC Requirements for Interior Sealants

A. The VOC content of sealants, or sealant primers used in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications."

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

1. Sealants

a.	Architectural	250
b.	Other	420

2. Sealant Primer

a.	Architectural – Nonporous	250
b.	Architectural – Porous	775
c.	Other	750

1.7 VOC Requirements for Interior Paints

A. Paints and Primers: Paints and primers used in non-specialized interior applications (i.e., for wallboard, plaster, wood, metal doors and frames, etc.) shall meet the VOC limitations of the Green Seal Paint Standard GS-11, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:

1. Volatile Organic Compounds
   a. The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by the U.S. Environmental Protection Agency (EPA) Reference Test Method 24.
      1) Interior Paints and Primers (non-flat) – 150 g/l
      2) Interior Paints and Primers (flat) – 50 g/l

B. Anti-Corrosive and Anti-Rust Paints

1. Anti-corrosive and anti-rust paints applied to interior ferrous metal substances shall meet the VOC limitations of the Green Seal Paint Standard GS-03 requirements as follows:
   a. Volatile Organic Compounds
      1) The VOC concentrations (in grams per liter) of the product shall not exceed those listed by the EPA Reference Test Method 24: Anti-Corrosive and Anti-Rust Paints – 250 g/l.

1.8 VOC Requirements for Interior Coatings

A. Clear wood finishes, floor coatings, stains, sealers and shellacs applied to the interior shall meet the VOC limitations defined in Rule 113. The VOC limits defined by SCAQMD, based on 07/09/04 amendments, are as follows. VOC limits are defined in grams per liter, less water and less exempt compounds.

1.	Clear wood finishes - Varnish	350
2.	Clear wood finishes – Sanding Sealers	350
3.	Clear wood finishes – Lacquer	550
4.	Shellac – Clear	730

5.	Shellac – Pigmented	550
6.	Stains	250
7.	Floor Coatings	100
8.	Waterproofing Sealants	250
9.	Sanding Sealers	275
10.	Other Sealers	200

2.0 PRODUCTS

Not Applicable

3.0 EXECUTION

Not Applicable

END OF SPECIFICATION

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Price and Payment Procedures:
   1. Alternates
   2. Allowances

1.2 ALTERNATES

A. Total Price: Provide total price for each alternate in Bid Form. Include cost of modifications to other work to accommodate alternate. Include related costs such as overhead and profit.

B. Acceptance of Alternates: Owner will determine which alternates are selected for inclusion in the Contract.

C. Coordination of Alternates: Modify or adjust affected adjacent work as necessary to integrate work of the alternate into Project. Coordinate alternates with related work to ensure that work affected by each selected alternate is properly accomplished.

D. List of Alternates (if applicable):
   1. Refer to Spec Section 01 2300 – Alternates

1.3 ALLOWANCES

A. Allowances: Unit cost allowances are as indicated on the Drawings. Amounts shall include all costs including overhead and profit except as specifically noted. Coordinate allowances with requirements for related and adjacent work.

B. Notification of Owner: Notify Owner of date when final decision on allowance items is required to avoid delays in the work.

C. Certification of Quantities: Furnish certification that quantities of products purchased are the actual quantities needed with reasonable allowance for cutting or installation losses, tolerances, mixing, waste, and similar margins.

D. Invoices & Delivery Slips: Submit invoices or delivery slips to indicate actual quantities of materials delivered and costs. Indicate amounts of applicable trade discounts.

PART 2 **PRODUCTS** - Not Applicable to This Section

PART 3 **EXECUTION** - Not Applicable to This Section

END OF SECTION

SECTION 01 2300
ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
   1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS - Not Applicable to This Section

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1

Glass Block at Egress Stair Enclosures

Provide lump sum add-alternate cost to furnish and install 60-min glass block wall assembly (Seves glass block, clarity 8x8x4 thickset 60 or approved equal), in lieu of 1-hr rated gypsum board wall assembly at all egress stair enclosures . (see details 5 & 6/A1.4 in the drawing set for more information)

B. Alternate No. 2

Guard Panels at Entry Stair

1. Provide lump sum add alternate cost to furnish and install 1/2" tempered glass in lieu of metal mesh infill panels at interior entry monumental stair (see details 2&3/A5.2)

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Administration of Contract: Provide administrative requirements for the proper coordination and completion of work including the following:
   1. Supervisory personnel.
   2. Preconstruction conference.
   3. Project meetings, minimum of two per month; prepare and distribute minutes.

B. Reports: Submit Daily and Special Reports as applicable

C. Work Schedule: Submit progress schedule, updated monthly.

D. Submittal Schedule: Prepare submittal schedule; coordinate with progress schedule.

E. Schedule of Values: Submit Schedule of Values

F. Schedule of Tests: Submit schedule of required tests including payment and responsibility.

G. Perform Surveys: Lay out the work and verifying locations during construction.

H. Emergency Contacts: Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.

I. Record Documents: Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

1.2 SUBMITTALS

A. Types of Submittals: Provide types of submittals listed in individual sections and number of copies required below. All submittals are to be submitted digitally via email
   1. Shop drawings, reviewed and annotated by the Contractor – pdf format.
   2. Product data – pdf format.
   3. Samples - as required to indicate range of color, finish, and texture to be expected.
   4. Inspection and test reports – pdf format.
   5. Warranties – Sample Warranty with Product Data, Executed Warranty with Closeout Documents.
   6. Survey Data – As applicable
   7. Closeout submittals – Physical Thumb drive, 2 copies.

B. Submittal Procedures: Comply with project format for submittals. Comply with submittal procedures established by Architect including Architect's submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.
   1. Submittals to be titled per the 32-Divisions of CSI,
      a. Example: 08 4313-001-00 – Aluminum Storefront PD
      b. Example: 08 4313-002-00 – Aluminum Storefront Shop Drawings

C. Samples and Shop Drawings: Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.

D. Requests for Information (RFIs): RFIs are to be submitted with detailed descriptions of the issue(s) and include potential solutions from the contractor for remedying the issue for the Architect's evaluation and response. RFIs not containing detailed information may be rejected in part or in whole until the responsible contractor provides the necessary information. The responsible contractor will not dictate the method of response from the Architect, it is at the Architect and/or Design Team's discretion as to the formality of their response. RFIs are to begin at "001"

E. Warranties: Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. Contractor, supplier, or installer responsible for performance of warranty shall sign warranties.

1.3 LEED REQUIREMENTS AND SCORECARD

A. Not Applicable

PART 2 **PRODUCTS** - Not Applicable to This Section

PART 3 **EXECUTION** - Not Applicable to This Section

END OF SECTION

SECTION 01 3200
NE-CHPS SUBMITTALS

PART 1 GENERAL

1.1 SUMMARY

A. This specification section specifies administrative and procedural requirements for submittals required to achieve the specified NE-CHPS certification.

B. Sustainable Design Intent: Comply with project requirements intended to achieve a Certified Rating, measured and documented according to the Northeast Collaborate for High Performance Schools Criteria (NE-CHPS) Version 3.0.

1.2 GENERAL REQUIREMENTS

A. The Contractor is required to implement practices and procedures to meet the project's environmental goals, which include achieving NE-CHPS criteria. Specific project goals which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor shall ensure that the requirements related to these goals, as defined in the sections below and in the related sections of the Contract Documents, are implemented to the fullest extent feasible. See attached NE-CHPS EXHIBIT A.

1.3 SUBMITTAL PROCEDURES

A. NE-CHPS submittal requirements are to include submission of MATERIALS CREDITS DOCUMENTATION SHEET. Information to be supplied for this form includes, but is not limited to, the following:
   1. Cost breakdowns for materials included in the contractor's or subcontractor's work. Cost breakdowns include total cost plus labor, equipment and material costs.
   2. The amount of savaged, refurbished or reused materials and products.
   3. The amount of recycled content in the supplied products, with percentages broken down to indicate post-consumer and pre-consumer percentages.
   4. The location of the raw materials extracted, harvested, or recovered and then used to manufacture the supplied products.
   5. The manufacture location for the supplied products.

B. Submit Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the MATERIALS CREDITS DOCUMENTATION SHEET.

C. Submit Product Data Sheets for materials that meet the NE-CHPS Building Performance criteria.

D. Submit certification required for Construction Waste Management, Construction IAQ Management and Construction Pollution Controls.

E. Submit Material Safety Data Sheets (MSDS) for all applicable products.

F. Submittals shall be provided in approved NE-CHPS format.

PART 2 PRODUCTS - Not Applicable to This Section

PART 3 EXECUTION - Not Applicable to This Section

END OF SECTION

NE-CHPS EXHIBIT A

State of Rhode Island and Providence Plantations
DEPARTMENT OF EDUCATION
Shepard Building
255 Westminster Street
Providence, Rhode Island 02903-3400

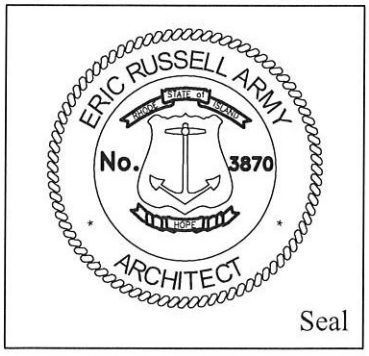
GREEN BUILDING PRE-CONSTRUCTION PROJECT CERTIFICATION

DATE	12 November 2024
SCHOOL DISTRICT	Pawtucket School Department
PROJECT	Shea High School Life Safety Upgrades - Stairs and Egress
NAME OF BUILDING	Charles E. Shea Senior School
ADDRESS	485 East Avenue
	Pawtucket, RI 02860

SUMMARY OF WORK:

The Pawtucket School Department is in the process of completing mandatory life safety upgrades throughout the district based on a Plan of Action developed with the Fire Department. The proposed scope in this package will address items 7, 10, and 14 at Shea High School, which will correct deficiencies in the rated stair enclosures, the interior hand/guard rail assemblies, and the hand/guardrail assemblies in the exterior stairs.

In accordance with the School Construction Regulations and Rhode Island General Law 37-24-4, I **Eric Russel Army** RI Registration Number **3870** being a registered professional Architect/Engineer and the Registered Design Professional in responsible charge of the project named above, hereby certify that, to the best of my knowledge, such drawings, computations, and specifications meet all applicable provisions of the Northeast Collaborative for High Performance Schools protocol *(project checklist attached)*.



Seal

Firm Name: Signal Works Architecture
Address: 11 Aleppo Street
Providence, RI 02909
Phone: 401.400.ARCH

Signature of Architect/Engineer

Superintendent's Statement:
I hereby acknowledge the above and agree to notify the Rhode Island Department of Education of any changes to this agreement.

Signature of Superintendent

NE-CHPS EXHIBIT A

NE-CHPS v4.0 Designed

Updated September 2024

Project Summary & Status

CHPS Project Number:	
Project Name:	Shea High School - Life Safety Upgrades - Stairs and Egress
Expected Construction Completion Date:	Spring/Summer 2025
Project Type:	Non-Classroom
CHPS Certification Pursued:	Designed
Submission Type:	Other
Required Point Threshold:	NA
Total Points Verified:	
All Prereqs Satisfied:	
Project Status:	

All electric design:	
ZNE:	
ZNE Capable:	
Major systems included in the CHPS scope (if renovation):	
Building Envelope	
Interior Surfaces	
HVAC	
Lighting	
Site	

Please provide a brief project narrative highlighting any notable high performance features. If construction is phased, please explain the phasing and provide expected dates of completion. If there are multiple buildings in the project scope, please list them and indicate building type, size, number of classrooms, and student/staff occupancy.

The Pawtucket School Department is in the process of completing mandatory life safety upgrades throughout the district based on a Plan of Action developed with the Fire Department. The proposed scope in this package will address items 7, 10, and 14 at Shea High School, which will correct deficiencies in the rated stair enclosures, the interior hand/guard rail assemblies, and the hand/guardrail assemblies in the exterior stairs.

No classroom or other educational spaces are being renovated as a part of this project. No work is being proposed to the building envelope, Interior Finishes, HVAC systems, Lighting, or the Site Landscaping.

Additional CHPS Reviewer Comments:

Project Scorecard

Credit	Prereq/ Subcredit	Title	Points Possible	Design Review Required	Construction Review Required	Points Targeted	*Instructions:* *Complete the aqua cells under "Project Summary and Status" above and in the "Points Targeted" column below by filling in the blanks or using the drop downs. Columns E-H are for reference regarding submission phase and whether a CHPS worksheet is required. Please use the "Project Team Narrative" column to provide CHPS with detailed narratives documenting how the intent of each criterion was achieved. Use labels such as "DR1", "DR2", "CR1", and "CR2" to indicate which submission the narrative applies to. Prerequisites are highlighted. Subcredits are italicized and can be cumulative, exclusive, or a combination.* **Project Team Narrative**	Points Verified	Points Pending	Points Denied	CHPS Reviewer Comments
Integration & Innovation		**Subtotal**	**26**			**0**		**0**	**0**	**0**	
II P1.0	**P**	**Integrated Design**	**4**	•			*Below is an example of how team narratives should be organized (please delete this when completing the scorecard):* DR1: First pass team design review narrative (if applicable). DR2: Second pass team design review clarification (if applicable). CR1: First pass team construction review narrative (if applicable). CR2: Second pass team construction review clarification (if applicable)				*CHPS will respond to project team narratives and clarifications in this format:* DR1: First pass CHPS design review comment (if applicable).Outstanding issues requiring further clarification will be in red for all review passes. DR2: Second pass CHPS design review comment (if applicable).
II 1.1		**Enhanced Integrated Design**	**2**	•	•						
II 2.1		**District Level Commitment**	**1**	•							
II 3.1		**School Master Plan**	**1**	•							
II 4.1		**High Performance Transition Plan**	**1**	•							
II 5.0	**P**	**Educational Display**	**1**	•	•						
II 5.1		**Demonstration Area**	**1**	•	•						
II 6.1		**Educational Integration**	**2**		•						
II 7.1		**Design for Adaptation**	**3**	•	-			**0**	**0**	**0**	
	II 7.1.1	*Climate Vulnerability Assessment*	*1*	•							
	II 7.1.2	*Design for Climate Adaptation*	*1*	•	•						
	II 7.1.3	*Passive Habitability/Survivability*	*1*	•	•						
II 8.0	**P**	**Safer Schools By Design**	**3**	•	•						
II 9.1		**Innovation (CHPS Verified Projects only)**	**4**	•	•						
II 10.1		**Biophilic & Responsive Design**	**3**	•				**0**	**0**	**0**	
	II 10.1.1	*Biophilic Design*	*1*	•							
	II 10.1.2	*Responsive Design*	*1*	•							
	II 10.1.3	*Educational Materials*	*1*	•							
Operations		**Subtotal**	**24**			**0**		**0**	**0**	**0**	
OM 1.0	**P**	**Facility Staff and Occupant Training**	**4**	•	•						
OM 2.1		**Post-Occupancy Transition**	**2**		•						
OM 3.0	**P**	**Performance Benchmarking**	**3**	•							

OM 4.0	**P**	**Systems Maintenance Plan**	**1**							
OM 4.1		**High Performance Operations**	**3**		•		**0**	**0**	**0**	
	OM 4.1.1	*Monitoring & Benchmarking*	*1*		•					
	OM 4.1.2	*Designate Resource Manager*	*1*		•					
	OM 4.1.3	*Designate Advocate*	*1*		•					
OM 5.0	**P**	**Indoor Environmental Management Plan**	**2**		•					
OM 6.1		**Green Cleaning**	**2**		•					
OM 7.0	**P**	**Integrated Pest Management**	**1**	•	•					
OM 8.0	**P**	**Anti-Idling Measures**	**1**	•	•					
OM 9.1		**Green Power**	**2**	•						
OM 10.0	**P**	**ENERGY STAR Equipment and Appliances**	**2**	•						
OM 11.1		**Computerized Maintenance Management System**	**1**		•					
Indoor Environmental Quality		**Subtotal**	**70**			**0**		**0**	**0**	**0**
EQ 1.0	**P**	**HVAC Design - ASHRAE 62.1**	**8**	•	•					
EQ 1.1		**Enhanced Filtration**	**2**	•	•					
EQ 1.2		**Dedicated Outdoor Air System**	**3**	•						
EQ 2.0	**P**	**Pollutant and Chemical Source Control**	**2**	•	•					
EQ 3.0	**P**	**Outdoor Moisture Management**	**1**	•	•					
EQ 4.1		**Ducted Returns**	**2**		•					
EQ 5.1		**Construction Indoor Air Quality Management**	**5**	•	•		**0**	**0**	**0**	
	EQ 5.1.1	*Occupied Buildings Under Construction*	*1*	•	•					
	EQ 5.1.2	*Duct Cleanliness*	*2*	•	•					
	EQ 5.1.3	*Building Flush Out*	*2*	•	•					
EQ 5.2		**Construction Moisture Management**	**1**	•	•					
EQ 6.1		**Post Construction Indoor Air Quality**	**1**	•	•					
EQ 7.0	**P**	**Low Emitting Materials**	**2**	•	•					
EQ 7.1		**Additional Low Emitting Materials**	**5**	•	•		**0**	**0**	**0**	
	EQ 7.1.1	*Adhesives & Sealants*	*1*	•	•					
	EQ 7.1.2	*Flooring Systems*	*1*	•	•					
	EQ 7.1.3	*Composite Wood and Agrifiber Products*	*1*	•	•					
	EQ 7.1.4	*Furniture & Furnishings*	*1*	•	•					
	EQ 7.1.5	*Paints & Coatings*	*1*	•	•					
	EQ 7.1.6	*Ceiling & Wall Systems*	*1*	•	•					
EQ 8.1		**Low Radon**	**1**	•						
EQ 9.1		**Thermal Comfort - ASHRAE 55**	**4**	•						
EQ 10.1		**Individual Controllability**	**1**	•	•					
EQ 10.2		**Controllability of Systems**	**1**	•	•					
EQ 11.0	**P**	**Daylighting: Glare Protection**	**4**	•						
EQ 11.1		**Daylight Availability**	**5**	•	•		**0**	**0**	**0**	
	EQ 11.1.1	*Classrooms*	*3*	•	•					
	EQ 11.1.2	*Support Spaces*	*2*	•	•					
EQ 12.0	**P**	**Views**	**1**	•						
EQ 12.1		**Additional Views**	**2**	•						
EQ 13.1		**Electric Lighting Performance**	**3**	•	•		**0**	**0**	**0**	
	EQ 13.1.1	*Fidelity and Gamut Area*	*2*	•	•					
	EQ 13.1.2	*RoHS*		•	•					
	EQ 13.1.3	*LED Performance*	*1*	•	•					
EQ 13.2		**Superior Electric Lighting Performance**	**5**	•	•		**0**	**0**	**0**	
	EQ 13.2.1	*Multi-scene Indirect/Direct Lighting Systems*	*2*	•	•					
	EQ 13.2.2	*General and Audio Visual Modes*		•	•					
	EQ 13.2.3	*A/V Mode Illumination*		•	•					
	EQ 13.2.4	*Whiteboard Illumination*		•	•					
	EQ 13.2.6	*Enhanced Teacher Controls*	*1*	•	•					
	EQ 13.2.7	*Advanced Classroom Controls*		•	•					
	EQ 13.2.8	*High Performance Lighting Systems*	*2*	•	•					
EQ 14.0	**P**	**Acoustical Performance**	**7**	•	•					
EQ 15.1		**Low-EMF Wiring**	**1**	•	•					
EQ 15.2		**Low-EMF Best Practices**	**2**	•	•		**0**	**0**	**0**	
	EQ 15.2.1	*Low EMF Best Practices for Computers*	*1*	•	•					
	EQ 15.2.2	*Wired local area network (LAN) to reduce RF EMF*	*1*	•	•					
	EQ 15.2.3	*Wired Phones to reduce RF EMF in classroom*		•	•					
EQ 16.1		**High Intensity Fluorescent Fixtures**	**1**	•	•					
Energy		**Subtotal**	**68**			**0**		**0**	**0**	**0**
EE 1.0	**P**	**Energy Performance**	**6**	•						
EE 1.1		**Superior Energy Performance**	**40**	•						
EE 2.1		**Zero Net Energy Capable**	**3**	•						

EE 3.0	P	Commissioning	4	•	•						
EE 3.1		Additional Commissioning Qualifications	1	•	•						
EE 3.2		Building Envelope Commissioning	1	•	•						
EE 3.3		Enhanced Commissioning	1	•	•						
EE 4.0	P	Environmentally Preferable Refrigerants	1	•							
EE 5.1		Energy Management System	2	•							
EE 5.2		Advanced Energy Management System and Submetering	2	•							
EE 6.1		Natural Ventilation & Energy Conservation Interlocks	2	•	•						
EE 7.0	P	Local Energy Efficiency Incentives and Assistance	2	•	•						
EE 8.1		Variable Air Volume Systems	1	•							
EE 9.1		Renewable Energy Performance Monitoring	1	•	•						
EE 10.1		Electric Vehicle Charging	1	•	•						
Water		Subtotal	21			0		0	0	0	
WE 1.0	P	Minimum Reduction in Indoor Potable Water Use	5	•	•						
WE 2.1		Reduce Potable Water Use for Sewage Conveyance	4	•	•						
WE 3.0	P	Irrigation and Exterior Water Budget- Use Reduction	4	•	•						
WE 4.1		Reduce Potable Water Use for Non-Recreational Landscaping	2	•	•						
WE 5.1		Reduce Potable Water Use for Recreational Landscaping	1	•	•						
WE 6.0	P	Irrigation Systems Commissioning	1	•	•						
WE 7.1		Rainwater Collection and Storage	2	•							
WE 8.1		Water Management System	2	•	•						
Site		Subtotal	22			1		0	0	0	
SS 1.0	P	Site Selection	2	•							
SS 2.1		Environmentally Sensitive Land	3	•							
SS 3.1		Minimize Site Disturbance	1	•							
SS 4.1		Construction Site Runoff Control and Sedimentation	1	•	•						
SS 5.1		Post Construction Stormwater Management	1	•	•						
SS 6.1		Central Location	2	•							
SS 7.1		Located Near Public Transportation	1	•							
SS 8.1		Joint-Use of Facilities	1	•							
SS 9.1		Human-Powered Transportation	2			1		0	0	0	
	SS 9.1.1	*Safe Access to School*	*1*	•	•	*1*	DR1: The school has existing means of securing bicycles in accordance with SS9.1, and the scope of the project addresses the handrail and guardrail requirements of the site stairs and ramps leading to the				
	SS 9.1.2	*Safe Bike Lanes*	*1*	•							
	SS 9.1.3	*Safe Routes to School*			•						
SS 10.1		Reduce Heat Islands - Landscaping and Sites	1	•							
SS 11.1		Reduce Heat Islands - Cool Roofs and Green Roofs/Walls	1	•	•						
SS 12.1		Avoid Light Pollution and Unnecessary Lighting	2	•	•			0	0	0	
	SS 12.1.1	*Outdoor Lighting Controls*	*1*	•	•						
	SS 12.1.2	*Outdoor Lighting Fixtures*	*1*	•	•						
SS 13.1		School Gardens	1	•	•						
SS 14.1		Use Locally Native Plants for Landscape	1	•							
SS 15.0	P	Site and Building Best Practices	2	•							
Materials & Waste Management		Subtotal	19			6		0	0	0	
MW 1.0	P	Storage and Collection of Recyclables	2	•	•						
MW 2.0	P	Minimum Construction Site Waste Management	2	•	•	2	DR1: The project intends to recycle all demolished metal handrails, and intends to salvage and re-use the exisitng doors slated to be replaced which exceeds the 50% target in MW 2.0				
MW 2.1		Construction Site Waste Management	2	•	•	1	DR1: The project intends to recycle all demolished metal handrails, and intends to salvage and re-use the exisitng doors slated to be replaced which exceeds the 75% target in MW 2.1.1				
MW 3.1		Single Attribute - Recycled Content	2	•	•						
MW 4.1		Single Attribute - Rapidly Renewable Materials	1	•	•						
MW 5.1		Single Attribute - Certified Wood	1	•	•						
MW 6.1		Single Attribute - Materials Reuse	1	•	•						
MW 7.1		Multi-Attribute Materials Selection	2	•	•						
MW 8.1		Building Reuse - Exterior	2	•	•	2	DR1: The project will maintain 100% of the existing building's structure and shell (exterior skin and framing, excluding window assemblies) which exceeds the 50% minimum of MW8.1				
MW 9.1		Building Reuse - Interior	1	•	•	1	DR1: The project will maintain 99% of the existing building's non-structural elements (interior walls, doors, floor coverings, and ceiling systems) which exceeds the 50% minimum of MW9.1				
MW 10.1		Health Product Related Information Reporting	1	•	•						
MW 11.1		Locally Produced Materials	2	•	•						
		Total	250			7		0	0	0	

SECTION 01 3300
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Refer to Spec Section 01 3000 – Administrative Requirements for Types of Submittals Required

B. Refer to Spec Section 01 3000 - Administrative Requirements for Appropriate Standards

C. Comply with submittal procedures established by Architect including Architect's submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.

D. Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.

E. Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. Warranties shall be signed by contractor, supplier, or installer responsible for performance of warranty.

F. Architect and engineer(s) have **10-business days** to review submittals, and **5-business days** to review and respond to Requests for Information (RFIs).

PART 2 - **PRODUCTS** - Not Applicable to This Section

PART 3 - **EXECUTION** - Not Applicable to This Section

END OF SECTION

SECTION 01 3516
ALTERATIONS PROJECT PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Summary: The procedures and administrative requirements of this Section apply to all of the following Sections of the Specification which are involved in alterations to the existing building.

B. Extent Notes: Cut into or partially remove portions of the existing building as necessary to make way for new construction. Include such work as:

1. Cutting, moving or removal of items shown to be cut, moved, or removed.

2. Cutting, moving or removal of items not shown to be cut, moved, or removed, but which must be cut, moved, or removed to allow the new work to proceed. Work or items which are to remain in the finished work shall be patched or reinstalled after their cutting, moving, or removal, and their joints and finishes made to match adjacent or similar work.

3. Removal of existing surface finishes as needed to install new work and finishes.

4. Removal of abandoned items and removal of items serving no useful purpose, such as abandoned piping.

5. Repair or removal of dangerous or unsanitary conditions resulting from alterations work.

C. Patch, match, repair, refinish or reinstall existing items to remain in finished work, to specified condition for each material, with joints and finishes made to match adjacent or similar work.

D. Relocate and reinstall designated existing salvaged materials.

1.2 SCHEDULING AND ACCESS

A. Work Scheduling/Sequence:

1. Any work to be performed during hours other than normal business hours (8:00 A.M. to 5:00 P.M. Monday through Friday unless noted otherwise) must have prior approval of the Project Manager.

B. Maintenance of Access and Operations:

1. During the period of construction, the Owner may continue to perform normal activities in the existing building. Maintain proper and safe access to the Owner-occupied areas at all times.

2. Schedule and coordinate demolition and remodeling operations with Owner in such a manner as to allow Owner operations to continue with minimum interruption.

3. During period of construction, do not obstruct in any manner existing exit ways of Owner-occupied areas. Prior to removal of existing exit ways (stairs, corridors, doors)

as part of new Work, provide and maintain new exit ways so as to maintain same number of exit ways. Maintain existing fire doors in an operable condition.

C. Maintenance of Existing Services:

1. Maintain environmental control in existing building, especially temperature,

humidity and dust control.

2. Provide temporary lines and connections as required to maintain existing mechanical and electrical services in building.

3. Notify the Property Manager a minimum of three (3) days prior to each required interruption of mechanical or electrical services in building. Such interruptions shall be only at such times and for lengths of time as approved by the Property Manager. In no event shall interruption occur without prior approval of the Property Manager.

D. Building Access:

1. Contractor shall access building at time designated by Property Manager or Owner.

2. Access to construction areas within the building shall be as designated by the Property Manager or Owner.

3. Restrict construction traffic to areas specifically designated by the Property Manager or Owner.

1.3 ALTERATIONS, CUTTING AND PROTECTION:

A. Do not start any cutting or alterations work until dust protection is in place.

B. Extent:

1. Cutting and removal work shall be performed so as not to cut or remove more than is necessary and so as not to damage adjacent work.

2. Conduct work in such a manner as to minimize noise and to minimize accumulation and spread of dirt and dust.

3. Perform cutting for ductwork and other rectangular openings with carborundum saw with approved dust arrestor.

4. Drill holes for conduit and piping using core drills.

C. Shoring, Bracing and Capping: Provide shores, needling and bracing as needed to keep building structurally secure and free of deflection in all its parts, and as needed for installation of new structural members. In telephone equipment areas, all shoring shall be wood or other approved nonconductive material, and shall not be secured to, braced from, or supported by telephone equipment or cable racks.

D. Responsibility and Assignment to Trades:

1. Contractor shall assign the work of moving, removal, cutting, patching and repair to trades under his supervision so as to cause the least damage to each type of work encountered, and so as to return the building as much as possible to the appearance of new work.

2. Patching of finish materials shall be assigned to mechanics skilled in the work of the finish trade involved.

E. Protection:

1. Protect remaining finishes, equipment, and adjacent work from damage caused by cutting, moving, removal and patching operations. Protect surfaces which will remain a part of the finished work.

2. Protect existing facilities and features, within designated construction limits and along corridor access route to construction area.

3. Cover existing wall and floor finishes in work areas, in adjacent areas and along corridor access route to prevent damage from product delivery and construction operations. Use same UL listed sheeting material as specified for temporary partitions below.

4. Material to be stored on floor must be placed on 1/4 in. tempered hardboard (Masonite) sheeting or other approved substrate. Do not lean material against walls or equipment.

5. During demolition, cutting and construction, provide positive dust control by wetting dust debris and by completely sealing openings to Owner occupied areas with temporary partitions, so as to prevent spread of dust and dirt to adjacent areas.

6. After materials, equipment and machinery are installed, properly protect Work until final acceptance.

7. Any damage resulting from construction operations shall be repaired by the Contractor without cost to the Owner.

8. All access points to the building shall remain secure. Doors remaining open for a period of time for material delivery or removal shall be protected against unauthorized entry.

F. Salvage:

1. Salvage sufficient quantities of cut or removed material to replace damaged work or patch new work where required. Protect and provide dry, secure storage for items to be reused.

2. Salvage items specifically indicated for salvage and reuse, as noted on drawings.

3. Do not incorporate salvaged or used material in new construction, except where small quantities of finish material which are difficult to match or duplicate are approved for patching or extending purposes by Architect or except as specifically indicated.

4. Salvaged items left over after completion of Work shall be disposed of by Contractor, unless scheduled to be turned over to Owner.

G. Temporary Barricades/Partitions: As applicable, provide and maintain temporary and dust partitions to seal openings to Owner-occupied areas. Provide partitions as required to maintain dust control. Partition locations may or may not be indicated on the Drawings.

1. Type 1 Partitions: (Maintained in place for 30 days or less) Framing: Commercial softwood species, fire-retardant treated in accordance with AWPA C20, and bearing UL Label FR-S. Provide continuous 2 x 4 top and bottom plates, 2 x 4 studs at 24 in. o.c., and continuous 2 x 4 bridging 4 ft. studs may be used. At Contractor's option, drywall metal studs may be used. Provide 3-5/8 in. wide metal studs at 24 in. o.c., with continuous head and floor channels.

   Covering: Areas Designated by Owner – Griffolyn type 55 FR or Durashield 8000FR reinforced sheeting, listed by Underwriters' Laboratories, Inc., as having a flame spread rating of less than 25 and smoke developed rating of less than 50. Apply double thickness of sheeting, fastened to one side with no-tear fasteners. Tape joints continuously.

   Note: In situations where Type 1 Partitioning will be installed within 2 ft. of existing or proposed telecommunications equipment, the sheeting shall be Griffolyn type 55 ASFR or Durashield 8000ASFR, anti-static, fire retardant sheeting.

2. Type II Partitions: (Maintained in place 18 months or less)

   Framing: (same as Type I above)

   Covering: 1/4 in. thick tempered hardboard or 1/2 in. thick plywood, listed by Underwriters' Laboratories, Inc., as having a flame spread rating of less than 25 and smoke developed rating of less than 50. Apply to one side and fasten to studs with drywall screws at 12 in. o.c., countersunk. Fire-retardant paint or fireproof coating is not required.

3. Type III Partitions: (Maintained in place longer than 18 months)

   Type: One hour fire rated gypsum drywall partition.

   Framing: 3-5/8 in. wide metal drywall studs. Provide continuous head and floor runners. Space studs at 24 in. o.c.

   Covering: One layer of 5/8 in. thick Type "X" gypsum board each side, fastened to studs and runners with drywall screws at 12 in. o.c. Tape and bed panel joints.

4. Doors: Type I and II Partitions: Single acting doors, opening out, with sturdy closer, closing against gasketed stops on frame to reduce passage of dust. Cover one side of each door with same material as used to cover partitions. Provide ample wood push bars and bump plates.

   Type III Partitions: Fire-resistive door and frame assembly bearing UL "C" Labels, complete, including metal frame, door, and hardware.

5. Sealing: Seal perimeter of partitions and doors to prevent passage of dust. At Type I and II partitions, tape fastener depressions, joints between panels and joints between panels and floors, ceilings, and columns with 2 in. wide pressure sensitive tape.

6. Mats: Provide mats at doors to reduce tracking of dust. Replace or clean daily.

H. Debris:

1. Remove debris promptly from the site each day.

2. Do not let piled material endanger structure.

3. During cutting and coring operations, use metal lined wood box secured tight against surface, to catch falling debris and water.

1.4 PATCHING, EXTENDING AND MATCHING:

A. Skill:

1. Patch and extend existing work using skilled mechanics who are capable of matching the existing quality of workmanship. The quality of patched or extended work shall not be less than that specified in the Sections of the product and execution Specifications which follow these General Requirements.

B. Patching:

1. In areas where any portion of an existing finished surface is damaged, lifted, stained, or otherwise made or found to be imperfect, patch or replace the imperfect portion of the surface with matching material.

2. Provide adequate support or substrate for patching of finishes.

3. If the imperfect surface was a painted or coated one, repaint or recoat the patched portion in such a way that uniform color and texture over the entire surface results.

4. If the surrounding surface cannot be matched, repaint, or recoat the entire surface.

C. Quality:

1. In the Sections of the product and execution of Specifications which follow these General Requirements, no concerted attempt has been made to describe each of the various existing products that must be used to patch, match, extend or replace existing work. Obtain all such products in time to complete the Work on schedule. Such products shall be provided in quality which is in no way inferior to the existing products.

2. The quality of the products that exist in the building, as apparent during pre-quotation site visits, shall serve as the Specification requirement of strength, appearance, and other characteristics.

D. Transitions:

1. Where new work abuts or finishes flush with existing work, make the transition as smooth and workmanlike as possible. Patched work shall match existing adjacent work in texture and appearance so as to make the patch or transition invisible to the eye at a distance of no closer than three (3) feet.

2. Where masonry or other finished surface is cut in such a way that a smooth transition with new work is not possible, terminate the existing surface in a neat fashion along a straight line at a natural line of division and provide trim appropriate to the finished surface.

3. Where two or more spaces are indicated to become one space, rework floors and ceilings so that horizontal planes, without breaks, steps or bulkheads result.

4. In cases of extreme change of level (3 in. or more), obtain instructions from Project Manager as to method of making transition. Either stepping, bulkheading, encasement, ramping, sloping or change of transition line shall be employed, or a combination of these, as directed in each case by the Project Manager.

E. Matching:

1. Restore existing work that is damaged during construction to a condition equal to its condition at the time of the start of the Work.

2. At locations in existing areas where partitions are removed, patch the floors, walls and ceilings with finish materials to match adjacent finishes.

F. Overall Requirement that the Work Be Complete:

1. Where a product or type of construction occurs in the existing building, and it is not specified as a part of the new work, provide such products or types of construction as needed to patch, extend or match the existing work.

2. These Specifications will generally not describe existing products or standards of execution, nor will they enumerate products which are not a part of the new construction. The existing product is its own specification.

3. The presence of any product or type of construction in the old work shall cause its patching, extending, or matching to be performed, as necessary to make the work complete and consistent, to identical standards of quality.

1.5 REPAIR:

A. Replace work damaged in the course of alterations, except at areas approved by the Project Manager for repair.

B. Where full removal of extensive amounts of almost-suitable work would be needed to replace damaged portions, then filling, spackling, straightening, and similar repair techniques, followed by full painting of other finishing, will be permitted.

C. If the repaired work is not brought up to the standard for new work, the Project Manager will direct that it be cut out and replaced with new work.

1.6 FIRESTOPPING:

A. Where existing fire-rated partitions, walls or floors are penetrated by new work, each trade providing such new work shall seal around penetrating conduit, pipe, duct or sleeve in accordance with manufacturer's printed instructions and specifications.

B. Refer to Section 07 8400 – Firestopping for any additional, applicable information.

1.7 CLEANING:

A. Each Successive Trade:

1. As each trade finishes its work on each part of the alterations work and related new work, it shall clean up its work areas and make work surfaces ready for the work of the succeeding trades.

2. Spillage, overspray, collections of dust or debris, and damage to Owner-occupied spaces shall be cleaned or remedied immediately by the responsible trade.

B. Each Area as it is Completed:

1. As soon as work in each area of the alterations is complete, clean up all surfaces, remove equipment, salvage, and debris, and return in condition suitable for use by the Owner as quickly as possible.

PART 2 – PRODUCTS - Not Applicable to This Section

PART 3 – EXECUTION - Not Applicable to This Section

END OF SECTION

SECTION 01 35 20
INDOOR AIR QUALITY MANAGEMENT

1.0 GENERAL

1.1 Summary

A. Section includes special requirements for Indoor Air Quality (IAQ) management during construction operations.

1. Control of emissions during construction.
2. Moisture control during construction.

B. Procedures for testing baseline IAQ. Baseline IAQ requirements specify maximum indoor pollutant concentrations for acceptance of the facility.

1.2 Definitions

A. Definitions pertaining to sustainable development as defined in ASTM E2114.

B. Adequate Ventilation: Ventilation, including, air circulation and air changes, required to cure materials, dissipate humidity, and prevent accumulation of particulates, dust, fumes, vapors or gases.

C. Hazardous Materials: Any material that is regulated as a hazardous material in accordance with 49 CFR 173, requires a Material Safety Data Sheet (MSDS) in accordance with 29 CFR 1910.1200.

D. Indoor Air Quality (IAQ): The composition and characteristics of the air in an enclosed space that affect the occupants of that space. The indoor air quality of a space refers to the relative quality of air in the building with respect to the contaminants and hazards and is determined by the level of indoor air pollution and other characteristics of the air.

E. Interior Final Finishes: Materials and products that will be exposed at interior, occupied spaces including flooring, wallcovering, finish carpentry and ceilings.

F. Packaged Dry Products: Materials and products that are installed in dry form and are delivered to the site in manufacturer’s packaging including carpets, resilient flooring, ceiling tiles and insulation.

G. Wet Products: Materials and products installed in wet form, including paints, sealants, adhesives, special coatings, and other materials which require curing.

1.3 Preconstruction Meeting

A. Following award of Contract and prior to commencement of project work, the Contractor is required to schedule a meeting with the Owner and project team to discuss the proposed IAQ management plan.

1.4 Submittals

A. IAQ Management Plan is to be provided prior to preconstruction meeting and is required to include the following information:
1. Procedures for control of emissions during construction
2. Procedures for moisture control during construction

B. Product Data:
   1. Product data for filtration media used during construction and during operations.
   2. Submit air pressure difference maps for mode of operation of HVAC.
   3. Material Safety Data Sheets
   4. Inspection test reports.

2.0 PRODUCTS

Not Applicable

3.0 EXECUTION

3.1 IAQ Management – Emissions Control

A. During construction operations, follow the recommendations in SMACNA IAQ Guidelines for Occupied Buildings under Construction.

B. HVAC Protection
   1. Seal return registers during construction
   2. Provide temporary exhaust during construction operations

C. Source Control – provide low and zero VOC materials as specified.

D. Pathway Interruption – isolate areas of work as necessary to prevent contamination of clean or occupied spaces. Provide pressure differentials, as required, to protect clean or occupied spaces.

E. Housekeeping – during construction, maintain project and building products and systems to prevent contamination of building spaces.

F. Temporary Ventilation – provide and ACH (air changes per hour) of 1.5 or more and as follows:
   1. Provide minimum 48-hour pre-ventilation of packages dry products prior to installation. Remove from packaging and ventilate in a secure, dry and ventilated space.
   2. Provide adequate ventilation during and after installation of interior wet products and interior final finishes.

G. Scheduling – schedule construction operations involving wet products prior to packaged dry products to the greatest extent possible.

H. Flush-Out – After the conclusion of construction, and prior to occupancy, perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot of floor area while maintaining an internal temperature of at least 60-degrees F and relative humidity no greater than 60%.

END OF SPECIFICATION

SECTION 01 40 00
QUALITY REQUIREMENTS

1.0 GENERAL

1.1 Section Includes

A. Quality control and control of installation.

B. Verification of Credentials and Licenses.

C. Tolerances

D. References.

E. Mock-up requirements.

F. Testing and inspection services.

G. Manufacturers' field services.

1.2 Quality Control and Control of Installation

A. Monitor a quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of the specified quality.

B. Comply with the manufacturers' instructions, including each step-in sequence.

C. When the manufacturers' instructions conflict with the Contract Documents, request a clarification from the Engineer before proceeding.

D. Comply with the specified standards as a minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform the Work by persons qualified to produce the required and specified quality.

F. Verify that field measurements are as indicated on the Shop Drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 Verification of Credentials and Licenses

A. An element of this oversight process is the verification that persons employed on the project site have appropriate and current credentials and licenses in their possession, at the project site, for the work they are performing.

B. Be forewarned that state resident inspectors will be checking for verification of credentials and licenses of both union and non-union persons, in their onsite inspections.

C. State resident inspectors will also be reviewing Contractor's Certified Monthly Payroll Records for conformance with RI State Prevailing Wage Rate requirements.

D. Those persons without the appropriate credentials and licenses will be subject to dismissal from the project site.

1.4 Tolerances

A. Monitor the fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with the manufacturers' tolerances. When the manufacturers' tolerances conflict with the Contract Documents, request a clarification from the Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.5 References

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by the date of issue current on the date of the Contract Documents, except where a specific date is established by code.

C. Obtain copies of the standards where required by the product specification Sections.

D. When the specified reference standards conflict with the Contract Documents, request a clarification from the Engineer before proceeding.

E. Neither the contractual relationships, duties, or responsibilities of the parties in the Contract, nor those of the Engineer, shall be altered from the Contract Documents by mention or inference otherwise in reference documents.

1.6 Mock-Up Requirements

A. Tests will be performed under the provisions identified in this Section and identified in the respective product specification Sections.

B. Assemble and erect the specified items with the specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where the mock-up has been accepted by the Engineer and is specified in the product specification Sections to be removed, remove the mock-up and clear the area when directed to do so by the Engineer.

1.7 Testing and Inspection Services

A. The Contractor will submit the name of an independent firm to the Engineer for approval by the Owner, to perform the testing and inspection services.

B. The independent firm will perform the tests, inspections and other services specified in the individual specification Sections and as required by the Engineer.

1. Laboratory: Authorized to operate in the location in which the Project is located.
2. Laboratory Staff: Maintain a full time registered Engineer on staff to review the services.

3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either the National Bureau of Standards or to the accepted values of natural physical constants.

C. Testing, inspections and source quality control may occur on or off the project site. Perform off-site testing as required by the Engineer or the Owner.

D. Reports will be submitted by the independent firm to the Engineer and the Contractor, in duplicate, indicating the observations and results of tests and indicating the compliance or non-compliance with Contract Documents.

E. Cooperate with the independent firm; furnish samples of the materials, design mix, equipment, tools, storage, safe access, and the assistance by incidental labor as requested.

1. Notify the Engineer and the independent firm 24 hours prior to the expected time for operations requiring services.
2. Make arrangements with the independent firm and pay for additional samples and tests required for the Contractor's use.

F. Testing and employment of the testing agency or laboratory shall not relieve the Contractor of an obligation to perform the Work in accordance with the requirements of the Contract Documents.

G. Re-testing or re-inspection required because of a non-conformance to the specified requirements shall be performed by the same independent firm on instructions by the Engineer.

H. Payment for the re-testing or re-inspection will be charged to the Contractor by deducting the testing charges from the Contract Sum.

I. Agency Responsibilities:

1. Test samples of mixes submitted by the Contractor.
2. Provide qualified personnel at the site. Cooperate with the Engineer and the Contractor in performance of services.
3. Perform specified sampling and testing of the products in accordance with the specified standards.
4. Ascertain compliance of the materials and mixes with the requirements of the Contract Documents.
5. Promptly notify the Engineer and the Contractor of observed irregularities or non-conformance of the Work or products.
6. Perform additional tests required by the Engineer.
7. Attend the preconstruction meetings and the progress meetings.

J. Agency Reports: After each test, promptly submit two copies of the report to the Engineer and to the Contractor. When requested by the Engineer, provide an interpretation of the test results.

K. Include the following:

1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

L. Limits On Testing Authority:

1. Agency or laboratory may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume any duties of the Contractor.
4. Agency or laboratory has no authority to stop the Work.

1.8 Manufacturers' Field Services

A. When specified in the individual specification Sections, require the material or Product suppliers, or manufacturers, to provide qualified staff personnel to observe the site conditions, the conditions of the surfaces and installation, the quality of workmanship, the start-up of equipment, or test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Submit the qualifications of the observer to the Engineer 30 days in advance of the required observations. Observer, subject to approval of Engineer.

C. Report the observations and the site decisions or instructions given to the applicators or installers that are supplemental or contrary to the manufacturers' written instructions.

END OF SPECIFICATION

SECTION 01 4500
QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Examine the Contract Documents and become thoroughly acquainted with the detailed material and workmanship requirements.

C. Comply with requirements of the Building Code of the State of Rhode Island for quality, workmanship, and requirements for all materials.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality-control and testing services.

B. Quality-control services include inspections, tests, reports and related actions performed by Contractor, independent agencies, governing authorities, engineers hired by the Owner and engineers employed by the Contractor.

C. Inspection and testing services are mandated by the laws and Building Code of the State of Rhode Island and are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with regulatory or Contract Document requirements.

D. Statement of Special Inspections and Contractor’s Statement of Responsibility follow this Section.

1.3 RESPONSIBILITIES

A. Special Inspection: The Owner shall select a Special Inspection Firm and pay for all Special Inspection Services, except as noted herein. The Contractor shall provide, be responsible for, and pay for the services for testing for
   1. To be determined by owner in concert with the contractor, if applicable.

B. The Contractor shall provide a Site Safety Program or Plan during all phases of construction.

C. Inspection and Testing Responsibilities other than those mandated by the State of Rhode Island as Special Inspections: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.

   1. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.
   2. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will employ and pay a

qualified independent testing agency to perform those services.
   a. Where the Owner has engaged a testing agency for testing and inspecting part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless agreed to in writing by the Owner.
3. The costs of the following tests and inspections shall be accounted for separately and reported to the Owner.
   a. Tests and inspection of materials and workmanship not conforming to contract requirements.
   b. Tests and inspection necessitated by any other noncompliance with contract requirements.
   c. Acceptance tests for materials because of changes in properties or changed sources.
   d. Costs of inspector's time and expenses wasted because of cancellations or delays of the work.
   e. Tests and services of inspectors required by a public authority.
   f. Energy performance inspections and test required to demonstrate compliance with Enterprise Green Communities certification Mandatory Building Performance Standard criteria.

B. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.
2. No part of the time lost to retesting shall be made the subject of a claim for extension of time or for excess cost or damages by the Contractor

C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

1. Provide access to the Work.
2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
4. Provide facilities for storage and curing of test samples.
5. Deliver samples to testing laboratories.
6. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
7. Provide security and protection of samples and test equipment at the Project Site.

D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Architect and the Contractor in performance of the agency's duties.

1. The Testing Laboratory shall make all necessary arrangements with the General Contractor to ensure the presence of the required inspectors at all contract operations specified to be included under the Testing and Inspection Agreement. The General Contractor shall notify the Testing Laboratory a reasonable time in advance (not less than 24 hours) of the time when operations requiring inspection or testing are scheduled to start.

2. Provide necessary personnel, equipment and facilities for tests and inspection. Personnel shall be experienced and competent in their particular specialties.
3. The Testing Laboratory shall conduct its work so as not to cause delay in the progress of construction. Any non-compliance with the Contract Documents shall be immediately reported to the General Contractor and the Architect.
4. The agency shall notify the Architect and the Contractor promptly of irregularities or deficiencies observed in the Work during the performance of its services.
5. Nothing specified herein permits the Testing Laboratory to allow the General Contractor to deviate from the requirements of the Contract Documents.
6. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
7. The agency shall not perform any duties of the Contractor.

E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.
2. A complete set of Drawings and Specifications for the project work will be made available by the Owner at the project site. The Testing Laboratory personnel shall become thoroughly familiar with all provisions of these documents which apply for the testing and inspection services.

1.4 SUBMITTALS

A. Qualifications: Submit qualifications of testing laboratories proposed for use for approval.

B. Schedule: Submit a schedule of required tests and inspections for review.

C. Reports: Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Architect. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
   a. Date of issue.
   b. Project title and number.
   c. Name, address, and telephone number of testing agency.
   d. Dates and locations of samples and tests or inspections.
   e. Names of individuals making the inspection or test.
   f. Designation of the Work and test method.
   g. Identification of product and Specification Section.
   h. Complete inspection or test data.
   i. Test results and an interpretation of test results.
   j. Ambient conditions at the time of sample taking and testing.
   k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
   l. Name and signature of laboratory inspector.
   m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.

1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

1.6 REFERENCE

A. American Society for Testing and Materials: ASTM E. 329-77: Inspection and Testing Agencies for Concrete Steel and Bituminous Materials as used in Construction.

B. Wherever the source or characteristics of materials change, or the quality of materials provided indicates lack of compliance with contract requirements, full or partial acceptance tests shall be performed as directed by the Structural Engineer of Record through the Architect.

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
1. The test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to applicable Engineer and Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Engineer’s, Architect’s, and Construction Manager’s (if applicable) reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Documents requirements for Division 01 Section “Cutting and Patching”.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are the Contractor’s responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

1.0 GENERAL

1.1 Section Includes

A. Temporary Utilities:

1. Temporary electricity.
2. Temporary lighting for construction purposes.
3. Temporary heating.
4. Temporary cooling.
5. Temporary ventilation.
6. Temporary water service.
7. Temporary sanitary facilities.

B. Construction Facilities:

1. Field offices and sheds.
2. Vehicular access.
3. Parking.
4. Progress cleaning and waste removal.

C. Temporary Controls:

1. Security.
2. Fire detection.
3. Water control.
4. Dust control.
5. Erosion and sediment control.
6. Noise control.
7. Pest control.
8. Pollution control.
9. Rodent control.

1.2 Summary

A. This section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 Temporary Electricity

A. The Owner will pay the cost of energy used. Exercise measures to conserve energy. Utilize the Owner's existing power service

1.4 Temporary Lighting for Construction Purposes

A. Permanent building lighting maybe utilized during construction.

1.5 Temporary Heating

A. Existing facilities shall be used.

1.6 Temporary Cooling

A. Existing facilities shall be used.

1.7 Temporary Ventilation

A. Utilize the existing ventilation equipment. Extend and supplement the equipment with temporary fan units as required to maintain clean air for construction operations.

1.8 Temporary Water Service

A. The Owner will pay the cost of temporary water. Exercise measures to conserve energy. Utilize the Owner's existing water system, extend and supplement with temporary devices as needed to maintain the specified conditions for construction operations.

1.9 Temporary Sanitary Facilities

A. The existing designated facilities located within each building may be used during construction operations. Maintain daily in a clean and sanitary condition.

B. At the end of construction, return the facilities to the same or better condition as the original condition.

1.10 Field Offices and Sheds

A. A designated existing space within the building may be used for field offices upon approval of Owner:

1.11 Vehicular Access

A. Location as approved by the Owner.

B. Provide unimpeded access for emergency vehicles. Maintain 20-foot width driveways with turning space between and around combustible materials.

C. Provide and maintain access to fire hydrants and control valves free of obstructions.

D. Use designated existing on-site roads for construction traffic.

1.12 Parking

A. Locate as approved by the Owner.

B. When site space is not adequate, arrange through the Owner for additional off-site parking.

C. Use of designated existing on-site streets and driveways for construction traffic is permitted. Tracked vehicles are not allowed on paved areas.

D. Use of designated areas of existing parking facilities by construction personnel is permitted.

E. Do not allow heavy vehicles or construction equipment in parking areas.

1.13 Progress Cleaning and Waste Removal

A. Maintain areas free of waste materials, debris, and rubbish. Maintain the site in a clean and orderly condition. Building must be clear of all debris at conclusion of each day. The building will remain a fully occupied building for the duration of the project.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean the interior areas prior to the start of surface finishing and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from the site periodically, weekly, or daily, as necessary to prevent an on-site accumulation of waste material, debris, and rubbish, and dispose off-site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.14 Security

A. Security Program:

1. Protect the Work, the existing premises, or the Owner's operations from theft, vandalism, and unauthorized entry.
2. Initiate the program in coordination with the Owner's existing security system at the mobilization.
3. Maintain the program throughout the construction period until Owner occupancy.

B. Entry Control:

1. Restrict the entrance of persons and vehicles into the Project site, or the existing facilities.
2. Allow entrance only to authorized persons with the proper identification.
3. Maintain a log of workers and visitors, make available to the Owner on request.
4. Coordinate the access of the Owner's personnel to the site in coordination with the Owner's security forces.

1.15 Fire Detection

A. Each day, before beginning any construction operations that can potentially trigger the existing fire alarm detection system, the Contractor is permitted to temporarily disconnect the system in the specific areas of construction, for as long as may be necessary. The Owner shall be notified each time the existing system is disabled.

B. Failure to so notify the Owner will subject the Contractor to a monetary fine for each occurrence, should the fire detection system be activated inadvertently by a construction activity.

1.16 Water Control

A. Grade the site to drain. Maintain excavations free of water. Provide, operate, and maintain the pumping equipment.

B. Protect the site from puddling or running water. Provide water barriers as required to protect the site from soil erosion.

1.17 Dust Control

A. Execute the Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into the atmosphere.

1.18 Erosion and Sediment Control

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize the amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

E. Periodically inspect the earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.19 Noise Control

A. Provide methods, means, and facilities to minimize noise produced by the construction operations.

1.20 Pest Control

A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work, or entering the facility.

1.21 Pollution Control

A. Provide methods, means, and facilities to prevent the contamination of soil, water, and the atmosphere from discharge of noxious, toxic substances, and pollutants produced by the construction operations.

1.22 Rodent Control

A. Provide methods, means, and facilities to prevent rodents from accessing or invading the premises.

END OF SPECIFICATION

SECTION 01 60 00
PRODUCT REQUIREMENTS

1.0 GENERAL

1.1 Section Includes

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

E. Product substitution procedures.

1.2 Products

A. Products: Means new material, machinery, components, fixtures, or systems forming the Work; but does not include the machinery or equipment used for the preparation, fabrication, conveying, or erection of the Work. Products may include the existing materials or components required or specified for reuse.

B. Furnish products of qualified manufacturers suitable for the intended use. Furnish products of each type by a single manufacturer unless specified otherwise.

C. Do not use materials and equipment removed from the existing premises, except as specifically permitted by the Contract Documents.

D. Furnish interchangeable components of the same manufacturer for the components being replaced.

1.3 Product Delivery Requirements

A. Transport and handle products in accordance with the manufacturer's instructions.

B. Promptly inspect shipments to ensure that the products comply with the requirements, the quantities are correct, and the products are undamaged.

C. Provide equipment and personnel to handle the products by methods to prevent soiling, disfigurement, or damage.

1.4 Product Storage and Handling Requirements

A. Store and protect the products in accordance with the manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to the product.

D. For exterior storage of fabricated products, place on sloped supports above the ground.

E. Provide bonded off-site storage and protection when the site does not permit on-site storage or protection.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent the condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store the products by methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of the products to permit access for inspection. Periodically inspect to verify that the products are undamaged and are maintained in acceptable condition.

1.5 Product Options

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of the manufacturers named and meeting the specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.6 Product Substitution Procedures

A. Instructions to Bidders specify the time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.

B. Substitutions may be considered only when a product becomes no longer in production following the date of receipt of the Purchase Order for this Contract. Submit certification both that specified product was carried in Bid and is no longer obtainable.

C. Document each request with complete data substantiating the compliance of a proposed Substitution with the Contract Documents.

D. A request constitutes a representation that the Bidder:

1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified product.
2. Will provide the same warranty for the Substitution as for the specified Product.
3. Will coordinate the installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the Owner.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse the Owner and the Engineer for review or redesign services associated with re-approval by the authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on the Shop Drawing or Product Data submittals, without a separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure, If Permitted Following Contract Award:

1. Submit three copies of a request for Substitution for consideration, no later than 20 working days following date of receipt of the Purchase Order for this Contract. Limit each request to one proposed Substitution.

2. Submit the Shop Drawings, Product Data, and the certified test results attesting to the proposed product equivalence. The burden of proof is on the proposer.
3. The Engineer will notify the Contractor in writing of a decision to accept or reject the request.

END OF SPECIFICATION

SECTION 01 6350
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Sections:

1. Spec Section 01 2200 – Unit Pricing for products selected under unit pricing.
2. Spec Section 01 2300 – Alternates for products selected under an alternate.
3. Spec Section 01 6000 – Product Requirements for requirements for submitting comparable product submittals for products by listed manufacturers.
4. Spec Section in Divisions 02 through 32 for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer an advantage to Contractor or Owner.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of ALL qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Qualities may include, but are not limited to attributes such as performance, weight, size, durability, visual effect, aesthetic characteristics, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from **manufacturer, on manufacturer's letterhead**, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within fourteen days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within **15** days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
   a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
   b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
   1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
      a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
      b. Substitution request is fully documented and properly submitted.
      c. Requested substitution will not adversely affect Contractor's construction schedule.

d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within **60 days after the Notice to Proceed**. Requests received after that time may be considered or rejected at the sole discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   b. Requested substitution does not require extensive revisions to the Contract Documents.
   c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   d. Substitution request is fully documented and properly submitted.
   e. Requested substitution will not adversely affect Contractor's construction schedule.
   f. Requested substitution has received necessary approvals of authorities having jurisdiction.
   g. Requested substitution is compatible with other portions of the Work.
   h. Requested substitution has been coordinated with other portions of the Work.
   i. Requested substitution provides specified warranty.
   j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 70 00
EXECUTION REQUIREMENTS

1.0 GENERAL

1.1 Section Includes

A. Examination.

B. Preparation.

C. Protection of adjacent construction.

D. Cutting and patching.

E. Special procedures.

F. Progress cleaning and waste removal.

G. Final cleaning.

H. Starting and adjusting of systems.

I. Demonstration and Instructions.

J. Testing, adjusting and balancing.

K. Protecting Installed Construction.

1.2 Examination

A. Acceptance of Conditions:

1. Verify that existing applicable site conditions, substrates, or substrate surfaces are acceptable or meet specific requirements of individual specifications Sections, for subsequent Work to proceed.
2. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
3. Examine and verify specific conditions described in individual specifications Sections.
4. Verify that utility services are available, of correct characteristics, and in correct locations.
5. Beginning of new Work, that relies upon the quality and proper execution of Work of a preceding trade, means acceptance of that preceding Work as appropriate for the proper execution of subsequent Work.
6. Acceptance of preceding Work that can be shown later to have adversely affected proper performance of new Work may result in removal and repeat performance of all Work involved at no cost to the Owner.

1.3 Preparation

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply substrate primer, sealer, or conditioner, required or recommended by manufacturer, prior to applying any new material or substance in contact or bond.

D. Prior to the application, installation, or erection of any products and product components, perform any other preparatory operations, or surface or substrate modifications, as may be specified or directed by product manufacturers.

1.4 Protection of Adjacent Construction

A. Protect existing adjacent properties and provide special protection where specified in individual Specification Sections.

B. Provide protective coverings at wall, projections, jambs, sills, and soffits of existing openings.

C. Protect existing finished floors, stairs, and other existing surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

D. Repair adjacent properties damaged by construction operations to original condition to the satisfaction of the Owner

E. Prohibit unnecessary traffic from existing landscaped areas.

F. Restore grassed landscaped areas damaged by construction operations to full healthy growth, by installing loam and sod to the requirements, and under the supervision of, the Owner.

1.5 Cutting and Patching

A. Employ original, or skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements which affect:
1. Structural integrity of element.
2. Integrity of weather-exposed or moisture-resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Visual qualities of sight-exposed elements.
5. Existing construction, or Work of separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
1. Fit the several parts together, to integrate with other Work.
2. Uncover Work to install or correct ill-timed Work.
3. Remove and replace defective and non-conforming Work.
4. Remove samples of installed Work for testing.
5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute Work by methods that will avoid damage to other Work and provide proper surfaces to receive patching and finishing.

E. Cut masonry, concrete, and other rigid materials using masonry saw or core drill.

F. Restore Work with new Products in accordance with requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.

H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

I. At penetration of fire rated, partitions, ceiling, or floor construction completely seal voids with fire rated or fire-resistant material in accordance with Section 07840, to full thickness of the penetrated element.

J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

K. Identify any hazardous substance or conditions exposed during the Work to the Engineer for decision or remedy.

1.6 Special Procedures

A. Materials: As specified in product Sections; match existing with new products, or salvaged products as appropriate, for patching and extending work.

B. Employ skilled and experienced installer to perform alteration work.

C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

E. Remove debris and abandoned items from area and from concealed spaces.

F. Prepare surface and remove surface finishes to provide installation of new Work and finishes.

G. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.

H. Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring products and finishes to original or specified condition.

I. Refinish existing visible surfaces to remain in renovated rooms and spaces to specified condition for each material, with a neat transition to adjacent finishes.

J. Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

K. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Engineer for review.

L. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition to Engineer for review.

M. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

N. Patch or replace portions of existing surfaces which are damaged, or showing other imperfections.

O. Finish the surfaces as specified in individual product Sections, or as indicated on the Drawings.

1.7 Progress Cleaning and Waste Removal

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site periodically or weekly and dispose of off-site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.8 Final Cleaning

A. Execute final cleaning of areas affected by the Work prior to final project assessment.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to a sanitary condition using cleaning materials appropriate to the surface and material being cleaned.

D. Clean or replace filters of operating equipment as directed by Engineer.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean site; sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.9 Starting And Adjusting Of Systems

A. Coordinate schedule for starting and adjusting of various equipment and systems.

B. Notify Engineer and Owner seven days prior to starting and adjusting of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.

D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute starting and adjusting under supervision of responsible Contractor's personnel or manufacturer's representative, in accordance with manufacturer's instructions.

G. Adjust operating Products and equipment to ensure smooth and unhindered operation.

H. When specified in individual specifications Section, require manufacturer to provide authorized representative to be present at the site to inspect, check, and approve equipment or system installation prior to starting, and to supervise placing of equipment or system in operation.

I. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

1.10 Demonstration and Instructions

A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manuals with Owner's personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate start-up, operation, control, adjustment, trouble shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled or agreed upon times, at equipment or system location.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.11 Testing, Adjusting, And Balancing

A. Submit, for the Owner's approval, the name of an independent firm to perform testing, adjusting, and balancing.

B. The independent firm will perform services specified in individual specifications Sections.

C. Reports will be submitted by the independent firm to the Engineer and the Owner indicating observations and test results, indicating compliance or non-compliance with specified requirements and with the requirements of the Contract Documents.

1.12 Protecting Installed Construction

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Repair or replace installed Work damaged by construction operations, as directed by the Engineer.

END OF SPECIFICATION

SECTION 01 7310
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Division 01 Section "Selective Demolition" for demolition of selected portions of the building for alterations.
2. Divisions 02 through 32 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
    a. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 22 and 32 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 QUALITY ASSURANCE

A. Structural Elements: Do not cut structural elements without the prior consent of the Architect

B. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Conveying systems.
7. Electrical wiring systems.
8. Operating systems of special construction in Division 13 Sections.

C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut, if necessary.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid or minimize interruption of services to occupied areas. Coordinate cutting or patching that might require interruptions in services with Architect and Owner.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete, [Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION

SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. The owner requires that this project generates the least amount of trash and waste possible. Additionally, this project shall comply with NE-CHPS MW-2.1.1 and that the contractor recycle, reuse, and/or salvage at least 75% (by weight) of nonhazardous construction and demolition waste, not including land clearing and associated debris.

1. Successful salvage, recycling, and diversion of construction and demolition materials is usually the result of a well thought out waste management plan and on-site training for contractors and subcontractors.
2. Compliance calculations for this criterion must be based on weight. Many recycling and landfill facilities weigh incoming materials. Shipments that cannot be weighed can be estimated based on their volume and density. Note that in Massachusetts, Alternative Daily Cover is not allowed in the calculations by regulation.
3. Recycle Rate (%) = [Recycled Waste [Tons] / (Recycled Waste [Tons] + Garbage [Tons])] x 100 (***Note: DO NOT include materials classified as hazardous wastes in these calculations***.)
4. The Construction Waste Management Plan should detail the following components:
   - The diversion percentage goals for C&D wastes, e.g., 75%. A 90% recycling rate may receive an Innovation point.
   - Recycling/reuse strategies and processes for onsite recycling, deconstruction and salvage, e.g., scheduling of different stages of deconstruction to best remove recyclable or salvageable materials intact.
   - On-site communication: the general contractor will detail communication strategies for construction workers and subcontractors about the recycling program and goals.
   - Waste management documentation: The construction waste management plan will specify documents needed to show waste diversion—e.g., weight tickets for all wastes removed from the site including recycled and salvaged materials.
   - Recycling summary: Recycling and waste data will be collected into a summary document for construction documentation.
5. Construction Review Requirements: Provide a diversion summary and back up documentation for where debris was taken.
6. Resources:
   - Recycling Construction and Demolition Wastes: A Guide for Architects and Contractors https://archive.epa.gov/region1/healthcare/web/pdf/cdrecyclingguide.pdf
   - US EPA Construction and Demolition Debris: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/construction-and-demolition-debris-material

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Methods of trash/waste disposal that are not acceptable are:
1. Burning on the project site.
2. Burying on the project site.
3. Dumping or burying on other property, public or private.

4. Other illegal dumping or burying.

E. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state, and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

C. Section 01 7000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating, and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse construction waste material in some manner on the project site.

K. Salvage: To remove waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Pre-bid meeting.
   2. Pre-construction meeting.
   3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 8113
SUSTAINABLE DESIGN REQUIREMENTS

PART 1- GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections, apply to this section.

1.2 SUMMARY

A. Section Includes:

1. General requirements and procedures for compliance with certain **NECHPS regulations prerequisites**
    a. Other **NECHPS regulations prerequisites** needed to obtain certification depend on material selections and may not be specifically identified as **NECHPS** requirements. Compliance with requirements needed to obtain **NECHPS prerequisites and credits** may be used as one (1) criterion to evaluate substitution requests and comparable product requests.
    b. Additional **NECHPS regulations prerequisites** needed to obtain the indicated certification depend on Architect's design and other aspects of project that are not part of the Work of the Contract.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Divisions 01 through 32 sections for HPB regulations requirements specific to the work of each of these sections. Requirements may or may not include reference to HPB regulations

1.3 DEFINITIONS

A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

B. LEED: Leadership in Energy & Environmental Design.

C. Rapidly Renewable Materials: Materials made from plants that are typically harvested within a 10-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.

D. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

E. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

F. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.

G. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or

scrap generated in a process and capable of being reclaimed within the same process that generated it.

1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section 01 33 00 "Submittal Procedures."

B. **General:** Submit additional **NECHPS regulations** submittals required by other specification sections.

C. **HPB regulations** submittals are in addition to other submittals. If the submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal "For Record" to verify compliance with indicated **NECHPS regulations** requirements.

D. **Project Materials Cost Data:** Provide statement indicating total cost for building materials used for project, excluding mechanical, electrical, and plumbing components, and specialty items such as elevators and equipment.

E. **NECHPS regulations Action Plans:** Provide preliminary submittals within **30** days of date established for **commencement of the Work** indicating how the following requirements will be met:

1. Waste Management Plan complying with Construction Waste Management and Disposal.
2. Salvaged and Refurbished Materials List: Identify each material that will be salvaged or refurbished, including its source and cost.
3. Recycled Content Materials List: Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
4. Certified Wood Products List: Indicate each product containing certified wood, including its source and cost of certified wood products.
5. Construction Indoor-air-quality Management Plan complying with Construction IAQ Management Plan.

F. **NECHPS regulations Progress Reports**: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with **NECHPS** regulations action plans for the following:

1. Waste Reduction Progress Reports complying with Division 01 Section 01 74 19 "Construction Waste Management and Disposal."
2. Salvaged and refurbished materials.
3. Recycled content.
4. Regional materials.
5. Certified wood products.

G. **NECHPS regulations Documentation Submittals:**

1. Product data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy-consumption performance over a period of not less than one (1) year of post-construction occupancy.
2. Waste Management Plan: Comply with Division 01 Section 01 7419 "Construction Waste Management and Disposal."
3. Salvaged and Refurbished Materials: Receipts for salvaged and refurbished materials used for project, indicating sources and costs for salvaged and refurbished materials.

4. Recycled Content: Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
5. Regional Materials: Product data indicating location and distance from project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
6. Certified Wood Products: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
7. Indoor Environmental Quality:
    a. Construction indoor-air-quality management plan.
    b. Product data for temporary filtration media.
    c. Product data for filtration media used during occupancy.
    d. Construction Documentation: Six (6) photographs at three (3) different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials.
8. Indoor Environmental Quality:
    a. Signed statement describing the building air flush-out procedures including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.
    b. Product data for filtration media used during flush-out and during occupancy.
    c. Report from testing and inspecting agency indicating results of indoor-air-quality testing and documentation showing compliance with indoor-air-quality testing procedures and requirements.
9. Adhesives and Sealants: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L.
10. Paints and Coatings: Product data for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L.
11. Carpet Systems: Product data for carpet and carpet cushion installed in the building interior indicating that the product complies with the CRI Green Label Plus testing program. Product data for carpet adhesives used in the building indicating VOC content in g/L.
12. Composite Wood, Agrifiber or Wood Glues: Product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.

PART 2 - PRODUCTS

2.1 SALVAGED AND REFURBISHED MATERIALS

A. Salvaged or Refurbished Materials: Provide salvaged or refurbished materials for **five (5)** percent of building materials (by cost). The following materials may be salvaged or refurbished materials:

1. Removed Historic Egress Doors

2.2 RECYCLED CONTENT OF MATERIALS

A. Recycled Content Materials: At least four major materials must be specified and installed in the project that meet the minimum total recycled content levels as listed below:

	Category	Product	Total Recycled Content	Post Consumer Recycled Content
1.	Bldg Insul.	Fiberglass Insulation	30%	30%
2.	Flooring	Linoleum	40%	0%
		Nylon Cpt Total Weight	10%	10%
		Polyester Cpt Fiber Face	25%	25%
		Rubber (non-tire-derived)	40%	0%
		Tire-derived Rubber	50%	50%
3.	Cabinetry	Medium Density Fiberboard	80%	0%
4.	Wall Coverings	Paint	50%	50%
5.	Aggregate Base and Subbase		50%	0%
6.	Structural Conc.	Fly Ash, Rice Hull Ash, or other Pozzolanic Materials (See credit restrictions on claiming credit for fly ash.)	25%	0%
7.	Structural Steel	Basic Oxygen Furnace (BOF) Produced Steel	16%	16%
		Electric Arc Furnace (EAF) Produced Steel	67%	67%

3. note: Fly ash generated from municipal solid waste incinerators is not an acceptable recycled content material under this criterion, nor is fly ash generated as a coal combustion by-product where the coal plant is fired with hazardous waste, medical waste or tire-derived fuel.

2.3 REGIONAL MATERIALS

A. Regional Materials: Provide [**10**] percent of building materials (by cost) that are regional materials.

2.4 CERTIFIED WOOD

A. Certified Wood Products: Provide a minimum of 50 percent (by cost) of wood-based materials that are produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1. Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:
   a. Rough carpentry.
   b. Miscellaneous carpentry.
   c. Heavy timber construction.
   d. Wood decking.
   e. Metal-plate-connected wood trusses.
   f. Structural glued-laminated timber.
   g. Finish carpentry.
   h. Architectural woodwork.
   i. Wood paneling.
   j. Wood veneer wall covering.
   k. Wood flooring.

l. Wood lockers.

m. Wood cabinets.

2.5 LOW-EMITTING MATERIALS

A. Adhesives, Sealants, and Sealant Primers: For field applications that are inside the weatherproofing system, use adhesives, sealants, and sealant primers that comply with the South Coast Air Quality Management District (SCAQMD) Rule #1168 effective July 1, 2005 and the rule amendment dated January 7, 2005.

1. Aerosol Adhesives: Comply with the requirements of the Green Seal Standard for Commercial Adhesives GS-36 in effect on October 19, 2000.

B. Paints and Coatings: For field applications that are inside the weatherproofing system, use paints and coatings that comply with the following limits for VOC content:

1. Architectural Paints, Coatings, and Primers Applied to Interior Walls and Ceilings: Do not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, First Edition dated May 20, 1993:
   a. Flats: 50 g/L.
   b. Non-flats: 150 g/L.
2. Anti-corrosive and Anti-rust Paints Applied to Ferrous Metal Substrates: Do not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition dated January 7, 1997.
3. Clear Wood Finishes, Floor Coatings, Stains, Sealers, and Shellacs Applied to Interior Elements: Do not exceed the VOC content limits established in the South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings in effect on January 1, 2004:
   a. Clear Wood Finishes: Varnish - not more than 350 g/L; Lacquer - not more than 550 g/L.
   b. Floor Coatings: VOC not more than 100 g/L.
   c. Sealers: Waterproofing sealers - not more than 250 g/L; Sanding sealers - not more than 275 g/L; All other sealers - not more than 200 g/L.
   d. Shellacs, Clear: VOC not more than 730 g/L.
   e. Shellacs, Pigmented: VOC not more than 550 g/L.
   f. Stains: VOC not more than 250 g/L.

C. Carpet Systems:

1. Carpet: Meet the requirements of the Carpet and Rug Institute's (CRI) Green Label Plus Program.
2. Carpet Cushion: Meet the requirements of CRI's Green Label Program.
3. Carpet Adhesive: VOC content of not more than 50 g/L.

D. Composite Wood and Agrifiber Products: Do not use composite wood or agrifiber products or adhesives that contain added urea-formaldehyde resin.

PART 3 - EXECUTION

3.1 [REFRIGERANT] [AND] [CLEAN-AGENT FIRE-EXTINGUISHING-AGENT] REMOVAL

A. Fundamental Refrigerant Management: Remove CFC-based refrigerants from existing HVAC&R equipment indicated to remain and replace with refrigerants that are not CFC based.

Replace or adjust existing equipment to accommodate new refrigerant as described in Division 23 sections.

B. Enhanced Refrigerant Management: Remove clean-agent fire-extinguishing agents that contain HCFCs or halons and replace with agent that does not contain HCFCs or halons. Refer to Division 21 sections additional requirements.

3.2 MEASUREMENT AND VERIFICATION

A. Measurement and Verification: Implement measurement and verification plan consistent with [Option B - Energy Conservation Measure Isolation] in the EVO's "International Performance Measurement and Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction," and as further defined by the following:

B. If not already in place, install metering equipment to measure energy usage. Monitor, record, and trend log measurements.

C. Evaluate energy performance and efficiency by comparing actual to predicted performance.

D. Measurement and verification period shall cover at least one year of post-construction occupancy.

3.3 CONSTRUCTION WASTE MANAGEMENT

A. Construction Waste Management: Comply with Division 01 Section 01 7419 "Construction Waste Management and Disposal."

3.4 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

A. Construction IAQ Management Plan During Construction: Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."

1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 01 Section 01 50 00 "Temporary Facilities and Controls", install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
2. Replace all air filters immediately prior to occupancy.

B. Construction IAQ Management Plan Before Occupancy:

1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of 14000 cu ft of outdoor air per sq ft of floor area while maintaining an internal temperature of at least 60 degrees F and a relative humidity no higher than 60 percent.
2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of 3500 cu ft of outdoor air per sq ft of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm per sq ft of outside air or the design minimum outside air rate determined in Sections 4 through 7 of ASHRAE Standard 62.1-2004, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three (3) hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14000 cu ft/sq ft of outside air has been delivered to the space.

E. Air-Quality Testing:

1. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the USGBC's "LEED-NC Reference Guide."

2. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
   a. Formaldehyde: 50 ppb.
   b. Particulates (PM10): 50 micrograms/cu. m.
   c. Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
   d. 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.
   e. Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
3. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from same locations as in the first test.
4. Air-sample testing shall be conducted as follows:
   a. All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
   b. Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.
   c. Number of sampling locations will vary depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq ft or for each contiguous floor area, whichever is larger, and shall include areas with the least ventilation and greatest presumed source strength.
   d. Air samples shall be collected between three (3) and six (6) feet from the floor to represent the breathing zone of occupants, and over a minimum four (4) hour period.

END OF SECTION

SECTION 02 4113
SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

B. Removal and disposal of obsolete equipment.

C. Abandonment and removal of obsolete utilities and conduit.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of benchmarks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

D. Section 01 7419 – Construction Waste Management & Disposal

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

A. Remove portions of the existing construction as required to install new work.

B. Remove equipment being replaced.

C. Remove MEP and other items being upgraded or replaced.

D. Remove items so noted on the drawings.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

E. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Dismantle existing construction and separate materials.
   2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.03 EXISTING UTILITIES

A. Protect existing utilities to remain from damage.

B. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

C. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

D. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

E. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.

3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 02 82 00
ASBESTOS REMEDIATION

1.0 GENERAL

1.1 Related Documents

A. All of the Contract Documents, including Drawings, General Conditions and other requirements apply to this project.

B. Known hazardous materials related to this project are limited to 2% chrysotile located in the baseboard mastic and the 9x9 floor tile in select areas of the building as indicated in the attached report.

1.2 Asbestos Procedures

A. There is known existing asbestos containing materials (ACM) in the existing building as identified in the attached report. The Contractor shall formally notify each sub-contractor that there are reports included for review.

B. Unknown and inaccessible ACM may be encountered during the project. Where the Contractor encounters discover or encounter ACM during the scope of work the Contractor shall notify the Owner immediately. Action should be taken immediately to reduce, control or eliminate the risk of exposure of contractors and the public to ACM.

C. Responsible Person: The Contractor is required to designate one (1) qualified on-site employee to be in charge of coordination with the project team and the Contractor with regards to the ACM.

D. Responsibility for Hazardous Materials Discovery: It is the sole responsibility of the Contractor and sub-contractors to undertake whatever measures and methods of procedures are necessary to appropriately safeguard the health and safety of all workers and members of the public with respect to any ACM discovery with the project work.

E. Indemnification: To the fullest extent permitted by law, the Contractor and sub-contractor shall indemnify and hold harmless by the Owner and project team and their agents and employees from and against any claims, damages, losses and expenses including, but not limited to, attorney's fees arising out of or relating to an such claim, damage, loss or expense if attributable to bodily injury, sickness, disease or death, or to damage to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, and is caused in whole or part by any negligent act or omission of the Contractor and sub-contractor anyone directly or indirectly employed by any of them or anyone whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

1.3 Lead Containing Surface Coatings and Building Components

A. The Contractor and sub-contractor shall be made aware that Lead Based Paints, other surface coatings, and building components may exist throughout the building. OSHA's Lead Standard for the Construction Industry, Tile 29 Code of Federal Regulations 1926.62, covers lead in a variety of forms, including metallic lead, all inorganic lead components, and organic lead soaps. OSHA's lead in construction standard applies to all construction work where an employee may be exposed to lead. All work related to construction, alteration, or repair, including painting, is included. In construction, lead was used in many different types of building component, surfacing, coatings and applications including, but not limited to, roofs, sidings/surfaces, tank linings, and electrical conduits, plumbing fixtures, pipes and waste lines, soft solder, used chiefly for soldering tinplate

and copper pipe joints, is an alloy of lead and tin, paint, varnish, shellac and other surface coating materials. Construction projects vary in their scope and potential for exposing workers to lead and other hazards. Due to the age of the building, it is assumed that there may be lead-containing building materials and surface coatings located within the interior of the building. It is the Contractor's responsibility to protect their employees from lead exposures and to prevent the release of lead into the environment. Contractor will be responsible to follow all local, state and federal, RI Department of Environmental Management (RIDEM), Occupational and Safety and Health Administration (OSHA), and Environmental Protection Administration rules, regulations and laws concerning lead in construction activities.

B. The Contractor and respective sub-contractors are solely responsible for means and methods and techniques used for demolition.

C. The Contractor and sub-contractor shall at his own cost and expense comply with all laws, ordinance, rules and regulations or Federal, State, Regional and Local authorities during demolition, prepping, sanding, cutting, burning, scraping, paint over, grinding and regarding handling, storing and disposing of demolition/renovation debris.

1.4 Other

A. The Contractor shall be made aware that other hazardous materials may be found inside the building.

2.0 PRODUCTS

Not Applicable

3.0 EXECUTION

Not Applicable

END OF SPECIFICATION

ATTACHMENT A: ASBESTOS MATERIAL REPORT

SECTION 05 4000
COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Load-bearing wall framing
2. Exterior non-load-bearing wall framing
3. Interior non-load-bearing wall framing exceeding height limitations of standard, nonstructural metal framing
4. Soffit framing

B. Related Requirements:
1. Section 07 2100 “Thermal Insulation”
2. Section 09 2116 "Gypsum Board Assemblies" for interior non-load bearing, metal-stud-framed, assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Qualification Data: For testing agency.

D. Welding certificates.

E. Product Certificates: For each type of code-compliance certification for studs and tracks.

F. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.
1. Steel sheet.
2. Expansion anchors.
3. Power-actuated anchors.
4. Mechanical fasteners.
5. Vertical deflection clips.
6. Horizontal drift deflection clips
7. Miscellaneous structural clips and accessories.

G. Evaluation Reports: For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

A. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

B. Welding Qualifications: Qualify procedures and personnel according to the following:

C. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following or equivalent:
   1. Basis of design: ClarkDietrich Building Systems
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
   1. Design Loads: As indicated on Drawings.
   2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
      a. Exterior Load-Bearing Wall Framing: Horizontal deflection of 1/480 of the wall height.
      b. Interior Load-Bearing Wall Framing: Horizontal deflection of 1/360 of the wall height under a horizontal load of 5 lbf/sq. ft..
      c. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/480 of the wall height.
      d. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/360 of the wall height under a horizontal load of 5 lbf/sq. ft.
      e. Floor Joist Framing: Vertical deflection of 1/480 for live loads and l/360 for total loads of the span.
      f. Roof Rafter Framing: Vertical deflection of 1/360 of the horizontally projected span for live loads.
      g. Ceiling Joist Framing: Vertical deflection of 1/360 of the span for live loads and 1/240 for total loads of the span.
   3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
   4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
      a. Upward and downward movement of 3/4 inch .
   5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

B. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated,

framing shall comply with AISI S100, AISI S200, and the following:
1. Wall Studs: AISI S211.
2. Headers: AISI S212.
3. Lateral Design: AISI S213.

C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.

2.3 COLD-FORMED STEEL FRAMING MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
1. Grade: As required by structural performance.
2. Coating: G60 (Z180), A60 (ZF180), AZ50 (AZM150), or GF30 (ZGF90).

B. Steel Sheet for Vertical DeflectionClips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade 50
2. Coating: G90

2.4 LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
2. Flange Width: 1-5/8 inches (41 mm).

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and as follows:
1. Minimum Base-Metal Thickness: Matching steel studs.
2. Flange Width: manufacturer's standard width .

C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
2. Flange Width: 1-5/8 inches (41 mm).

D. Steel Single- or Double-L Headers: Manufacturer's standard L-shapes used to form header beams, of web depths indicated, and as follows:
1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
2. Top Flange Width: 1-5/8 inches (41 mm).

2.5 EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
2. Flange Width: 1-5/8 inches (41 mm).

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: Matching steel studs.
2. Flange Width: manufacturer's standard width.

C. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.6 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Gusset plates.
8. Stud kickers and knee braces.
9. Joist hangers and end closures.
10. Hole-reinforcing plates.
11. Backer plates.

2.7 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 36 threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153

C. ICC-ES AC01 and ICC-ES AC193 are for expansion anchors in masonry and mechanical anchors in concrete respectively, and ICC-ES AC58 and ICC-ES AC308 are for adhesive anchors in masonry and concrete. Do not use expansion-type anchors where expansion can cause damage to the substrate material

D. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 as appropriate for the substrate.
1. Uses: Securing cold-formed steel framing to structure.
2. Type: adhesive anchor
3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633.
4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts.

E. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

F. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

G. Welding Electrodes: Comply with AWS standards.

2.8 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: MIL-P-21035B or SSPC-Paint 20.

B. Cement Grout: Portland cement, ASTM C 150/C 150M, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C 1107/C 1107M, and with a fluid consistency and 30-minute working time.

D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

2.9 FABRICATION

A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
   1. Fabricate framing assemblies using jigs or templates.
   2. Cut framing members by sawing or shearing; do not torch cut.
   3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
   4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.

C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet (1:960) and as follows:
   1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
   2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.

B. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled**.**

B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
   1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).

D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

H. Install insulation, specified in Section 072100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's

approved or standard punched openings.

3.4 LOAD-BEARING WALL INSTALLATION

A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
   1. Anchor Spacing: To match stud spacing.

B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch (3 mm) between the end of wall-framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
   1. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar configurations.

D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.

E. Align floor and roof framing over studs according to AISI S200, Section C1. Where framing cannot be aligned, continuously reinforce track to transfer loads.

F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure.

G. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
   1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.
   2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.

H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
   1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.

I. Install horizontal bridging in stud system, spaced vertically 48 inches. Fasten at each stud intersection.
   1. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges, and secure solid blocking to stud webs or flanges.

J. Install steel sheet diagonal bracing straps to both stud flanges; terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.

K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall- framing system.

3.5 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
   1. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Install single deep-leg deflection tracks and anchor to building structure.
   2. Install double deep-leg deflection tracks and anchor outer track to building structure.
   3. Connect vertical deflection clips to infill studs and anchor to building structure.
   4. Connect drift clips to cold-formed steel framing and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
   1. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
   1. Install solid blocking at 96-inch centers.

G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.6 ERECTION TOLERANCES

A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.7 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 05 5213
EXTERIOR PIPE AND TUBE RAILINGS & GUARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Free-standing railings at steps with color galvanizing.

B. Pipe & Tube Railings at ADA Ramps

1.02 RELATED REQUIREMENTS

A. Section 03 3300 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 05 5113 - Metal Pan Stairs: Handrails other than those specified in this section.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.

C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

D. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.

E. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

F. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 3300 - for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.

B. Allow for expansion and contraction of members and building movement without damage to connections or members.

C. Dimensions: See drawings for configurations and heights.

D. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

E. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.02 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M, Grade B cold-formed structural tubing.

B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

C. Galvanizing: In accordance with requirements of ASTM A123/A123M. Basis of Design – Duncan Galvanizing Color Galv. 616-389-8440.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I – Inorganic compatible with color galvanizing.
   2. ColorGalv 15 finish in color to be selected by Design Agent from full range. 20 year warranty against rust and 15 year warranty on the finish.

D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction, matching ColorGalv.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
   3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Finish: Galvanize after assembly.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

C. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

E. Field weld anchors as indicated on drawings. Grind welds smooth. Touch-up to maintain finish color and warranty.

F. Conceal anchor bolts and screws whenever possible and in compliance with approved shop drawings. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

SECTION 05 52 17

INTERIOR STEEL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.2 DESCRIPTION OF WORK

A. This Section includes the following:

1. Steel angle and plate railings.

1.3 RELATED WORK

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:
1. Section 05 51 00, Metal Stairs
2. Section 06 20 00, Finish Carpentry, wood handrail caps at steel railings.
3. Section 09 21 16, Gypsum Board Assemblies.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails:

a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

3. Infill of Guards:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).

b. Uniform load of 25 lbf/sq. ft. (1.2 kN/sq. m) applied horizontally.
c. Infill load and other loads need not be assumed to act concurrently.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.5 SUBMITTALS

A. Product Data: For railings, grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples: For each exposed finish required.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

PART 2 - PRODUCTS

2.1 METALS

A. General: Comply with the latest edition of the following standards:

1. AISI Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
2. AISC Code of Standard Practice for Steel Buildings and Bridges including requirements for Architecturally Exposed Steel.
3. AWS Code for Welding in Building Construction.
4. Specifications for Structural Joints using ASTM A325-07a or A490-08a Bolts, Research Council on Riveted and Bolted Structural Joints of Engineering Foundation.
5. SSPC Painting Manual, Vol. 1 - Good Painting Practice and Vol. 2 - Systems and Specifications.
6. Fed. Specs QQ-I-652A, Iron Gray Castings: QQ-S-741A, Steel Plates, Shapes and Bars, Carbon, Structural; WW-P-521, Malleable Iron.
7. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual", Ornamental Stairs: Architectural class.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

C. Steel and Iron:

1. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
2. Tubing: ASTM A 500 (cold formed) or ASTM A 513, Type 5 (mandrel drawn).
3. Plates, Shapes, and Bars: ASTM A 36/A 36M.
4. Castings: Either gray or malleable iron, unless otherwise indicated.

    a. Gray Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.
    b. Malleable Iron: ASTM A 47/A 47M.

2.2 MISCELLANEOUS MATERIALS

A. Fasteners: Provide concealed fasteners, unless unavoidable or standard for railings indicated.

1. Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

B. Anchors: Provide cast-in-place anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488.

C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

D. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

E. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

F. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer compatible with finish paint systems indicated, and complying with SSPC-Paint 5.

G. Grout and Anchoring Cement: Factory-packaged, nonshrink, nonmetallic grout complying with ASTM C 1107; or water-resistant, nonshrink anchoring cement; recommended by manufacturer for exterior use.

2.3 FABRICATION

A. General: Fabricate railings to comply with design, dimensions, and details indicated, but not less than that required to support structural loads.

B. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

C. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings.

D. Form changes in direction by bending or by inserting prefabricated elbow fittings.

E. Form curves by bending in jigs to produce uniform curvature; maintain cross section of member throughout bend without cracking or otherwise deforming exposed surfaces.

F. Close exposed ends of railing members with prefabricated end fittings.

G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

2.4 FINISHES

A. Steel and Iron:

1. Factory prime all steel railings for field painting.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Perform cutting, drilling, welding and fitting required for installing railings. Set railings accurately in location, alignment, and elevation.

1. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

B. Adjusting and Cleaning:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting.
2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Provide rough carpentry.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Lumber Standards and Grade Stamps: DOC PS 20, American Softwood Lumber Standard and inspection agency grade stamps.

C. Construction Panel Standards: DOC PS 1, U.S. Product Standard for Construction and Industrial Plywood; APA PRP-108.

D. Wood Framing Standards: NFPA House Framing Manual.
1. Exterior Wall Framing: 2 inch by 6-inch nominal (38 mm by 140 mm actual) studs, 24 inches (61 cm) on center.
2. Exterior Wall Framing: 2 inch by 4-inch nominal (38 mm by 89 mm actual) studs, 16 inches (40 cm) on center.
3. Interior Wall Framing: 2 inch by 4-inch (38 mm by 89 mm actual) studs, 16 inches (40 cm) on center.

E. Preservative Treatment: AWPA C2 for lumber and AWPA C9 for plywood; waterborne pressure treatment. Provide for wood in contact with soil, concrete, masonry, roofing, flashing, damp-proofing and waterproofing.

F. Fire-Retardant Treatment: AWPA C20 for lumber and AWPA C27 for plywood; noncorrosive type. Provide at building interior where required by code.

PART 2 PRODUCTS

2.1 MATERIALS

A. Rough Carpentry Applications:
1. Manufacturers, Wood Sheathing: Refer towww.arcat.com/divs/sec/sec06100.html
2. Application: Rooftop equipment bases and support curbs.
3. Application: Wood grounds, nailers, and blocking.
4. Application: Wood furring.
5. Application: Backing panels.
6. Application: Wood sheathing.
7. Application: Subflooring.
8. Application: Building wrap.

9. Building Wrap:
   a. Material: Air-retarder sheeting made from polyolefins; cross-laminated films, woven strands, or spun-bonded fibers; coated or uncoated; with or without perforations; ASTM E 1677, Type I.

PART 3 EXECUTION

3.1 INSTALLATION

A. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.

B. Plywood: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial"

C. Provide nailers, blocking and grounds where required. Set work plumb, level and accurately cut.

D. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with other work.

E. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.

F. Restore damaged components. Protect work from damage.

END OF SECTION

SECTION 07 84 00
THROUGH-PENETRATION FIRESTOPPING SYSTEMS

1.0 GENERAL

1.1 General Requirements

A. Work under this specification consists of the furnishing of all labor, materials, equipment, and services necessary for, and incidental to, the complete and proper installation of Underwriter's Laboratories, Inc. (UL) listed firestopping materials, systems, and/or devices for through-penetrations of fire-resistance rated assemblies, and smoke barriers.

1.2 Quality Assurance

A. Firestop system installation shall be performed by a firm acceptable to the firestopping material manufacturer.

B. Products, execution, and firestop systems shall conform to the applicable code requirements for the required fire-resistance ratings.

C. All firestopping materials shall be listed as a product by the manufacturer under the appropriate category for the intended use by Underwriter's Laboratories, Inc. (UL) and shall bear the "UL" label, or nationally recognized testing laboratory (NRTL).

D. All firestopping materials shall be new and unused.

E. Any case of error, omission, discrepancy or lack of clarity shall be promptly identified to the Owner.

1.3 Scope of Work

A. The scope of work includes the complete and proper installation of UL listed firestopping materials, systems, and/or devices for the buildings associated with this Contract.
   1. Through-penetrations of fire-resistance rated floor and roof construction associated with the new fire alarm and fire sprinkler system installations, and the life safety system upgrades.
   2. Through-penetrations of fire-resistance rated walls and partitions associated with the new fire alarm and fire sprinkler system installations, and the life safety system upgrades.

1.4 Contractor's Responsibilities

A. The Firestopping Contractor shall furnishing of all labor, materials, equipment, and services necessary for, and incidental to, the complete and proper installation of all UL listed firestop systems described in Section 1.3.

B. The Firestopping Contractor shall sequence and coordinate the installation of all firestop systems with other trades to ensure efficient installation of all firestop systems.

C. The Firestopping Contractor shall coordinate construction and cutting of openings so that each particular firestop system may be installed in accordance with its listing, including sizing, sleeves, and penetrating items.

D. The Firestopping Contractor shall maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install firestop systems under environmental conditions outside manufacturer's absolute limits.

E. The Firestopping Contractor shall provide ventilation as required by firestopping material manufacturer, including mechanical ventilation if required.

1.5 Qualification of Bidders

A. Installer Qualifications: A firm specializing in installation of firestop systems similar to those required for this project with a minimum of five (5) years of successful documented experience. The installer must also be licensed installer by the firestopping material manufacturer.

1.6 Codes and Standards

A. Rhode Island Fire Safety Code

B. Rhode Island State Building Code

C. All materials shall be listed for the intended use in Underwriters Laboratories, Inc. (UL), UL FRD Fire Resistance Directory.

D. If a UL listing for a specific device is unavailable, approval by FM Global (FM) or other nationally recognized testing laboratory (NRTL) acceptable to the Pentagon shall be acceptable.

E. American Society for Testing and Materials (ASTM):
1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials
2. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials
3. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops
4. ASTM E 1399 - Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems
5. ASTM E 1529 - Standard Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies
6. ASTM E 1725 - Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems for Electrical System Components

F. UL 1479 - Standard for Fire Tests of Through-Penetration Firestops

G. ANSI/UL 2079 - Tests for Fire Resistance of Building Joint Systems

H. Additional requirements of the Authority Having Jurisdiction (AHJ).

1.7 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary, apply to this Section.

1.8 Order of Precedence

A. Should conflicts arise out of discrepancies between documents referenced in this specification, the most stringent requirement shall apply; however, should a level of stringency be indeterminable, the discrepancies shall be resolved as follows:
1. State and local codes shall take precedence over this specification.
2. The National Fire Protection Association Standards shall take precedence over this specification.
3. This specification shall take precedence over the drawings

1.9 Firestop System Performance Criteria

A. General: For the following constructions, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.
   1. Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection rated openings.
   2. Fire-resistance-rated floor assemblies.
   3. Fire-resistance-rated roof assemblies.

B. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

C. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
   1. Penetrations located outside wall cavities.
   2. Penetrations located outside fire-resistive shaft enclosures.
   3. Penetrations located in construction containing fire-protection-rated openings.
   4. Penetrating items larger than 4-inch- (100-mm-) diameter nominal pipe or 16 sq. in. (100 sq. cm) in overall cross-sectional area.

D. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
   1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
   2. For floor penetrations with annular spaces exceeding 4 inches (100 mm) in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
   3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

E. For through-penetration firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 450, as determined per ASTM E 84.

F. Through Penetration Firestop System For Electrical Penetrations: Provide firestop systems complying with UL system No.5, R11044, tested in accordance with UL 1709, ASTM E 119, ASTM E 1529, and ASTM E 1725.

1.10 Submittals

A. Shop Drawings: For each different firestop system configuration, provide the following:
   1. Listing agency's detailed drawing showing opening, penetrating items, and firestopping materials, identified with listing agency's name and number or designation, fire rating achieved, and date of listing.
   2. Identify which rated assembly each system is to be used in.
   3. Any installation instructions that are not included on the detailed drawing.
   4. For proposed systems that do not conform strictly to the listing, submit listing agency's drawing marked to show modifications and stamped approved by firestop system manufacturer's fire protection engineer.
   5. Submit listing agency's test report showing compliance with requirements, based on testing of current products.

B. Product Certificates: Submit certificates signed by firestop system manufacturer certifying that materials furnished comply with requirements.

C. Product Data: Manufacturer's data sheets on each material to be used in firestop systems, including:
1. Product characteristics and Material Safety Data Sheets.
2. Listing numbers of systems in which each product is to be used.
3. Preparation instructions and recommendations.
4. Storage and handling requirements and recommendations.
5. Installation methods.

D. Installer's Qualification Documentation.

1.11 Warranty

A. The Contractor shall guarantee all material installed free from defects in workmanship and inherent mechanical defects for a period of one (1) year from the date of substantial completion of the project.

B. Upon completion of the installation of all firestop systems, the Contractor shall provide a signed written statement, substantially in the form as follows:

C. The warranty period will begin on the date of substantial completion of the project.

1.12 Delivery, Storage and Handling

A. Deliver and store products until ready for installation in manufacturer's original unopened packaging, legibly marked with manufacturer's name and product identification, date of manufacture, lot number, shelf life, listing agency's classification marking, curing time, and mixing instructions if applicable.

B. Store and handle in such a manner as to prevent deterioration or damage due to moisture, temperature changes, contaminants, and other causes; follow manufacturer's instructions.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local AHJ.

1.13 Definitions

A. Construction Gap: An open joint between adjacent rated assemblies; may be a moving joint or static opening, without penetrating items.

B. Firestop System: Specific firestopping material or materials, which when installed in openings in a specific rated assembly, achieve the performance required.

C. Firestop: Result of installation of firestop system.

D. Listing: The current, published listing of a system in a NRTL agency's directory.

E. Penetrating Item: Any item (pipe, duct, conduit, cable, etc.) that passes completely through a rated assembly through an opening of any size.

F. Rated Assembly: A wall, floor, roof/ceiling, or other construction, which is required to have an hourly fire rating or a smoke resistance rating.

G. Through Penetration: A hole through a rated assembly made to accommodate the passage of a penetrating item or an empty hole made for another purpose and not repairable using the original materials of construction.

2.0 PRODUCTS

2.1 Manufacturers

A. Acceptable Manufacturer's:
1. 3M Fire Protection Products, Inc, St. Paul, MN
2. Nelson Fire Stop, Tulsa, OK
3. Hilti, Tulsa, OK
4. Johns Manville, Denver, CO
5. Tremco, Cleveland, OH
6. The Rectorseal Corp., Houston, TX
7. Specified Technologies Inc., Sommerville, NJ

B. Single Source: All instances of a specific firestop system shall be made using products of the same manufacturer.

2.2 Materials

A. Sealants,

B. Mortar,

C. Compound,

D. Putty, putty pads, and inserts,

E. Compounds,

F. Spray mastics,

G. Intumescent wrap strips and collars,

H. Firestop pillows and collars,

I. Cable and joint spray,

J. Forming materials.

2.3 All Firestopping Materials

A. Listing Agency: Provide systems that are listed by at least one the following:
1. Underwriters Laboratories Inc. (UL), in "Fire Resistance Directory" category XHEZ or XHBN as appropriate.
2. Any other qualified independent testing and inspection agency that conducts periodic follow-up inspections and is acceptable to authorities having jurisdiction.
   a. Furnish products identical to those tested for classification by listing agency.
   b. Mark product packing with classification marking of listing agency.
   c. Unlisted Systems: Where firestop systems not listed by any listing agency are required due to project conditions, submit a substitution proposal with evidence specified.

d. Firestopping Exposed To View: Provide products with flame spread index of less than 25 and smoke developed index of less than 450, when tested in accordance with ASTM E 84.
e. Firestopping Exposed to View, Traffic, Moisture, or Physical Damage: Provide products that after curing do not deteriorate when exposed to those conditions during and after construction.
f. Materials: Use only products specifically listed for use in listed systems.
g. Compatibility: Provide products that are compatible with each other, with the substrates forming openings, and with the items, if any, penetrating the firestopping, under the conditions represented by this project, based on testing and field performance demonstrated by manufacturer.

B. Accessories: Provide all accessory materials required for complete installation; use materials specifically identified in system listings.

C. Identification Labels for Through Penetration Systems: Pressure sensitive self-adhesive vinyl labels, preprinted with the following information:

D. The words "Warning - Through Penetration Firestop System - Do not Disturb. Notify Building Management of Any Damage."
1. Listing agency's system number or designation.
2. System manufacturer's name, address, and phone number.
3. Installer's name, address, and phone number.
4. General contractor's name, address, and phone number (if applicable).
5. Date of installation.

3.0 EXECUTION

3.1 Examination

A. Do not begin installation until substrates have been properly prepared.

B. Conduct tests according to manufacturer's written recommendations to verify that substrates are free of oil, grease, rolling compounds, incompatible primers, loose mill scale, dirt and other foreign substances capable of impairing bond of firestopping.

C. Verify that items penetrating fire rated assemblies are securely attached, including sleeves, supports, hangers, and clips.

D. Verify that openings and adjacent areas are not obstructed by construction that would interfere with installation of firestopping, including ducts, piping, equipment, and other suspended construction.

E. Verify that environmental conditions are safe and suitable for installation of firestopping.

F. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

3.2 Preparation

A. Prepare substrates in accordance with manufacturer's instructions and recommendations.

B. Install masking and temporary coverings as required to prevent contamination or defacement of adjacent surfaces due to firestopping installation.

3.3 Installation

A. Install in strict accordance with manufacturer's detailed installation instructions and procedures.

B. Install so that openings are completely filled and material is securely adhered.

C. Where firestopping surface will be exposed to view, finish to a smooth, uniform surface flush with adjacent surfaces.

D. After installation is complete, remove combustible forming materials and accessories that are not part of the listed system.

E. Repair or replace defective installations to comply with requirements.

F. At each through penetration, attach identification labels on both sides in location where label will be visible to anyone seeking to remove penetrating items or firestopping.

G. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned.

H. Notify AHJ when firestopping installation is ready for inspection; obtain advance approval of anticipated inspection dates and phasing, if any, required to allow subsequent construction to proceed.

I. Do not cover firestopping with other construction until approval of AHJ has been received.

3.4 Field Quality Control

A. Owner may engage an independent testing agency to inspect installed firestopping and to prepare reports indicating whether the installed work complies with the contract documents.

B. Notify testing agency at least 7 days prior to date when firestopping installation will be ready for inspection; obtain advance approval of general schedule and phasing, if any, required to allow subsequent construction to proceed.

3.5 Protection

A. Protect installed systems and products until completion of project; where subject to traffic, provide adequate protection board.

B. Touch-up, repair or replace damaged systems and products before Substantial Completion.

END OF SPECIFICATION

SECTION 08 1100
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. The work of this section includes, but is not limited to, the following:

1. Interior and exterior flush metal doors.
2. Interior and exterior metal frames.

1.3 RELATED WORK

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:
1. Section 09 9000 – Painting and Coating: Field paint finish.
2. Section 08 7100 – Finish Hardware
3. Section 08 8100 – Glass & Glazing

1.4 SUBMITTALS

A. Product Data and Certifications: Submit manufacturer's product data, installation instructions, use limitations and recommendations for each door and frame product used. Provide manufacturers' certifications stating that products and assemblies comply with specification requirements.

B. Shop Drawings: Provide large scale shop drawings for fabrication and installation of all parts of the work. Provide large scale plans, elevations, and details of anchors, anchor spacing, reinforcement, connections, hardware preparation, and accessory items. Provide a schedule of doors and frames using the same references used on Contract Documents.

1.5 QUALITY ASSURANCE

A. Source: Provide products of one manufacturer for each type of door and frame required for the work of this section. Provide secondary materials and products which are acceptable to the door and frame manufacturers.

B. Reference Standards: Provide doors and frames that comply with Steel Door Institute SDI-100, *Recommended Specifications for Standard Steel Doors, and Frames*. Installing doors in strict compliance with SDI-105, *Recommended Erection Instructions for Steel Frames*, and Door Hardware Institute, *The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware*.

C. Fire-Ratings: For all doors and frames installed in fire-rated assemblies and where indicated

or required by authorities having jurisdiction, provide door and frame assemblies that comply with NFPA 80, *Standard for Fire Doors and Windows*, and which have been tested, listed and labeled in compliance with ASTM E2074, *Standard Methods of Fire Tests of Door Assemblies* by an independent agency acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE AND HANDLING

A. Storage and Handling: Strictly comply with Steel Door Institute recommendations. Protect from all possible damage.

B. Delivery Sequence: Avoid project delays but minimize on-site storage.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with requirements, provide sound rated doors and frames as indicated on Drawings, herein, or as an approved equal
1. Curries
2. Amweld
3. Ceco
4. Republic
5. Steelcraft
6. Substitutions: See Section 01 6000 - Product Requirements.

2.2 MATERIALS

A. Hot-Rolled Steel: ASTM A 1011, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

B. Cold-Rolled Steel: ASTM A 1008, Commercial Steel (CS), Type B; suitable for exposed applications.

C. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS), Type B; with minimum A40 zinc-iron-alloy (galvannealed) coating designation.

D. Electrolytic Zinc-Coated Steel Sheet: ASTM A 879.

E. Anchors and Fasteners: Manufacturer's standard units fabricated from not less than 18 gage galvanized sheet steel or 18 gage hot-dip galvanized steel complying with ASTM A153, class B.

F. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153.

G. Primer: Thermosetting primer which is compatible with finish system specified in Painting section.

2.3 FABRICATION

A. General Requirements: Fabricate work to be truly rigid, straight, plumb, level and square. Provide work matching sizes, shapes, and profiles indicated on approved shop drawings.

B. Exterior Doors and Frames: Fabricate exterior doors and frames from galvanized sheet steel with closed tops and bottoms and no places to catch or hold water.

C. Concealed Components: Fabricate concealed components in doors and frames from either hot or cold rolled steel.

D. Hardware Preparation: Fabricate doors and frames to receive mortised and concealed finish hardware as indicated on approved final hardware schedules. Comply with applicable provisions of ANSI A115 series specifications for hardware preparation.

1. Coordinate with Division 26, Electrical for door sensors and other security devices.

E. Hardware Locations: Locate hardware as indicated on final hardware shop drawings or, if not shown, as indicated in *Recommended Locations for Builder's Hardware*, published by Door and Hardware Institute.

2.4 STEEL DOORS

A. Types and Styles: Provide flush steel doors of types and styles indicated on drawings and schedules.

1. Door Faces: Fabricate exposed door faces only from stretcher leveled cold rolled steel.

B. Interior Doors: (For non-rated doors) SDI-100, grade II, heavy duty, 18 gage minimum face sheets, seamless construction, model 3 or 4.

C. Interior Doors: (Fire-rated) SDI-100, grade II, heavy duty, 18 gage minimum face sheets, seamless mineral fiberboard composite construction, model 4.

D. Interior Doors: (Sound-rated) SDI-100, grade II, heavy duty, 18 gage minimum face sheets, seamless, STC as ibndicated on Drawings, minimum 52 or better for single doors when tested according to ASTM E90 and classified according to ASTM E413.

E. Interior Doors: (Mechanical and Elevator Machine Rooms) SDI-100, grade III, extra heavy duty, 16 gage minimum face sheets, seamless.

F. Exterior Doors: SDI-100, grade III, extra heavy duty, 16 gage minimum galvanized steel face sheets, seamless, model 4, maximum apparent U factor of 0.24 btu/hr/ft^2/^{o}F when tested in compliance with ASTM C236.

G. Door Louvers: Provide sightproof V or Y shaped 24 gage steel blades set into 20 gage steel frame. Where located in a fire-rated assembly, provide self-closing, fire-rated louvers that are UL labeled. Provide louvers of size indicated with at least 50% free area.

H. Glazing Stops: Provide manufacturer's standard rolled steel shapes with mitered corners and countersunk, tamperproof fasteners. Locate screw heads on inside of rooms [least public side of door].

2.5 STEEL FRAMES

A. Provide STC rated frames for doors, transoms, sidelights, borrow lights and other openings as scheduled. Use concealed fastenings wherever possible.

1. Door Frames: Fabricate frames from cold rolled steel sheets, except galvanized steel at exterior frames.

B. Steel Gages: Provide frames and components fabricated from the following sheet steel gages:

1. Plaster guards and mortar boxes: 26 gage.
2. Interior frames 5' wide and smaller: 16 gage .
3. Interior frames over 5' wide: 14 gage .
4. Interior frames for paired doors with hold open devices: 14 gage.
5. Exterior frames: 14 gage.
6. Floor anchors: 14 gage .
7. Strike reinforcement: 14 gage.
8. Closer reinforcement: 12 gage.
9. Head channel reinforcement for frames over 4' wide: 12 gage .
10. Hinge reinforcement: 10 gage.

C. Anchors: Provide at least three anchors for each jamb; T type for masonry, Z type for metal studs. Provide floor anchors at both side. Provide UL approved anchors for fire-rated assemblies.

D. Frame Construction: Fabricate frames with mitered and fully welded corners and seams. Grind and dress welds and seams to be flush and invisible after priming.

E. Silencers: Prepare single door frames to receive 3 resilient silencers. Prepare double door frames to receive 2 resilient silencers.

F. Stops: Extend stops to bottom of frame [subfloor] and cut at 90^{O}.

2.6 FINISHES

A. Factory Primed: On all surfaces, including galvanized, provide minimum 1. mil dry film thickness of baked rust-inhibiting primer which is compatible with finish paint specified in Painting specification section. Prepare surfaces in strict compliance with SDI standards and instructions and recommendations of primer manufacturer.

B. Bituminous Coating: After priming, provide 1/16" thick coating of asphalt emulsion on concealed surfaces inside doors frames for all frames installed in an exterior wall or in contact with concrete or with masonry mortar.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Installer shall examine supports and conditions under which this work is to be performed and notify Contractor in writing of conditions detrimental to the proper completion of the work. Beginning work means Installer accepts substrates and conditions.

3.2 INSTALLATION

A. Manufacturer's Instructions and Recommendations: Strictly comply with manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this section. Comply with referenced standards.

B. Frames: Where possible, place frames prior to walls and ceilings. Accurately plumb, level, align, square and brace. Anchor frames securely at least three points near hinge locations on both jambs and at both sides into floor.

C. Doors: Install hinges supplied under Finish Hardware section and hang doors accurately into frame openings with uniform tight clearances around jambs and head. Doors shall swing freely without binding or scraping and shall remain motionless at any location when released unless affected by installation of closer.

D. Louvers and Glazing Stops: Install door louvers and glazing stops where scheduled or indicated. Provide symmetrically spaced fasteners not more than 8" o.c.

3.3 TOLERANCES

A. Fire-Rated Doors: Install fire-rated doors and frames with clearances specified in NFPA Standard 80.

B. Non-Rated Doors: Install non-rated doors in frames with clearances and tolerances specified in SDI-100.

3.4 ADJUSTING, TOUCH-UP AND REPAIR

A. After installation of doors and hardware, adjust clearances and operating parts to work easily, smoothly, and correctly. Doors shall not rub frame, scratch primer, nor bind.

B. Touch-up damaged shop coatings and repair minor damage to eliminate all evidence of repair. Remove and replace work which cannot be satisfactorily repaired.

END OF SECTION

SECTION 08 7100
FINISH HARDWARE

PART 1 − GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.
   2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:
   1. Mechanical door hardware.
   2. Electromechanical door hardware.
   3. Automatic operators.
   4. Cylinders specified for doors in other sections.

C. Related Sections:
   1. Division 08 Section “Hollow Metal Doors and Frames”.
   2. Division 08 Section “Sound Control Doors & Frames”.
   3. Division 28 Section “Electronic Safety and Security”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   1. ANSI A117.1 − Accessible and Usable Buildings and Facilities.
   2. ICCfIBC − International Building Code.
   3. NFPA 70 − National Electrical Code.
   4. NFPA 80 − Fire Doors and Windows.
   5. NFPA 101 − Life Safety Code.
   6. NFPA 105 − Installation of Smoke Door Assemblies.
   7. ULfULC and CSA C22.2 − Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
   8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
   1. ANSIfBHMA Certified Product Standards − A156 Series.
   2. UL10C − Positive Pressure Fire Tests of Door Assemblies.
   3. ANSIfUL 294 − Access Control System Units.
   4. UL 305 − Panic Hardware.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
   2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
   3. Content: Include the following information:
      a. Type, style, function, size, label, hand, and finish of each door hardware item.
      b. Manufacturer of each item.
      c. Fastenings and other pertinent information.
      d. Location of door hardware set, cross−referenced to Drawings, both on floor plans and in door and frame schedule.
      e. Explanation of abbreviations, symbols, and codes contained in schedule.
      f. Mounting locations for door hardware.
      g. Door and frame sizes and materials.
      h. Warranty information for each product.
   4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:
   1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer−installed and field−installed wiring. Include the following:
      a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
      b. Complete (risers, point−to−point) access control system block wiring diagrams.
      c. Wiring instructions for each electronic component scheduled herein.
   2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: By Owner.

E. Informational Submittals:
   1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this

Project and that have a proven record of successful in−service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in−service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
   1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
   2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

G. Keying Conference: Not applicable.

H. Pre−Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
   1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
   2. Inspect and discuss electrical roughing−in, power supply connections, and other preparatory work performed by other trades.
   3. Review sequence of operation narratives for each unique access controlled opening.
   4. Review and finalize construction schedule and verify availability of materials.
   5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock−up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software

and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre−wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in−field modifications.

D. Coordinate hardware with specialty door assemblies and ship (hinges, locking devices and other hardware as required) directly to manufacturer for shop assembly.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Twenty five years for manual overhead door closer bodies.
4. Five years for motorized electric latch retraction exit devices.
5. Two years for electromechanical door hardware, unless noted otherwise.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 − PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements through a basis of design. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants. Substitutions: See Section 01 6000 - Product Requirements.

D. Substitution Limitations: The Specifications listed in this document are to be considered the basis of design. Comparable Products from manufacturers listed herein will be accepted provided they meet requirements of this Specification. Substitutions: See Section 01 6000 - Product Requirements.

2.2 HANGING DEVICES

A. Hinges: ANSIƒBHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:
   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
   a. Widths up to 3’0”: 4−1ƒ2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” heavy weight.
3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   a. Exterior Doors: Heavy weight, non−ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
   a. Non−removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out−swinging lockable doors.
5. Manufacturers, (basis of design):
   a. Bommer Industries (BO).
   b. Hager Companies (HA).
   c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
   d. Substitutions: See Section 01 6000 - Product Requirements.

B. Continuous Geared Hinges: ANSIƒBHMA A156.26 Grade 1−600 certified continuous geared hinge. with minimum 0.120−inch thick extruded 6060 T6 aluminum alloy hinge leaves and a

minimum overall width of 4 inches. Hinges are non−handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut−outs. Provide custom screw pattern as required for aluminum door construction.

1. Manufacturers, (basis of design):
    a. Bommer Industries (BO).
    b. Hager Companies (HA).
    c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
    d. Substitutions: See Section 01 6000 - Product Requirements.

C. Pin and Barrel Continuous Hinges: ANSI*f*BHMA A156.26 Grade 1−600 certified pin and barrel continuous hinges with minimum 14 gauge Type 304 stainless steel hinge leaves, concealed stainless pin, and twin self−lubricated nylon bearings at each knuckle separation. Factory trim hinges to suit door height and prepare for electrical cut−outs.
    1. Manufacturers, (basis of design):
        a. Markar Products; ASSA ABLOY Architectural Door Accessories (MR).
        b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
        c. Substitutions: See Section 01 6000 - Product Requirements.

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Continuous Geared Transfer Hinges: Provide electrified transfer continuous geared hinges with a removable service panel cutout accessible without de−mounting door from the frame. Furnish with Molex™ standardized plug connectors with sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through−door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
    1. Manufacturers, (basis of design):
        a. Bommer Industries (BO) − SER−QC (# of wires) Option.
        b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) − SER−QC (# wires) Option.
        c. Substitutions: See Section 01 6000 - Product Requirements.

B. Electrified Quick Connect Stainless Steel Continuous Transfer Hinges: Provide electrified transfer stainless steel continuous hinges with electrical transfer access prep accessible without de−mounting door from the frame. Furnish with Molex™ standardized plug connectors with sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through−door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
    1. Manufacturers, (basis of design):
        a. Markar Products; ASSA ABLOY Architectural Door Accessories (MR) − MP−ETAP−EL (# wires) Option.
        b. Substitutions: See Section 01 6000 - Product Requirements.

C. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through−door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
    1. Manufacturers, (basis of design):

a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) − EL−CEPT Series.
b. Securitron (SU) − EL−CEPT Series.
c. Substitutions: See Section 01 6000 - Product Requirements.

D. Electric Door Wire Harnesses: Provide electric$f$data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through−door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through−door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
   a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) − Electrical Connecting Kit: QC−R001.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) Connector Hand Tool: QC−R003.
2. Manufacturers, (basis of design):
   a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) − QC−C Series.
   b. Substitutions: See Section 01 6000 - Product Requirements.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSIfBHMA A156.3 and A156.16, Grade 1, certified.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers, (basis of design):
   a. Door Controls International (DC).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).
   d. Substitutions: See Section 01 6000 - Product Requirements.

B. Door Push Plates and Pulls: ANSIfBHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push$f$Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1f2−inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1f2−inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
5. Manufacturers, (basis of design):
   a. Hiawatha, Inc. (HI).

b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
c. Trimco (TC).
d. Substitutions: See Section 01 6000 - Product Requirements.

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
1. Manufacturers, (basis of design):
a. Sargent Manufacturing (SA).
b. Substitutions: See Section 01 6000 - Product Requirements.
C. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat−type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Match Facility Standard.
D. Permanent Cores: By Owner.
E. Patented Cylinders: ANSI*ƒ*BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer's United States patents.
1. Patented key systems shall not be established with products that have an expired patent. Expired systems shall only be specified and supplied to support existing systems.
1. Manufacturers, (basis of design):
a. Medeco (MC) − X4 − By Owner.
b. Substitutions: See Section 01 6000 - Product Requirements.
F. Keying System: Key cylinders to match Owner's existing system.
G. Key Quantity: Provide the following minimum number of keys:
1. Construction Keys (where required): Ten (10).
2. Construction Control Keys (where required): Two (2).
H. Construction Keying: Provide construction master keyed cylinders.
I. Construction Keying: Provide temporary keyed construction cores.

2.6 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self−locking key clips, receipt forms, 3−way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
1. Manufacturers, (basis of design):
a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

d. Substitutions: See Section 01 6000 - Product Requirements.

B. Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into “Key Wizard” software.

2.7 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI*f*BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field−reversible for handing without disassembly of the lock body.
   1. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI*f*BHMA 156.13 requirements to 13 million cycles or greater.
   2. Manufacturers, (basis of design):
      a. Sargent Manufacturing (SA) − 8200 Series.
      b. Substitutions: See Section 01 6000 - Product Requirements.

B. Multi−Point Locksets: ANSI*f*BHMA A156.37, Certified Products Directory (CPD) listed vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual mounted outside lever trim controls available in a variety of ANSI*f*BHMA operational functions. Option for single top latching only eliminates the need for bottom strikes.
   1. Manufacturers, (basis of design):
      a. Sargent Manufacturing (SA) − 7000 Series.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.8 ELECTROMECHANICAL LOCKING DEVICES

A. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): ANSI*f*BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed, subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below and in the hardware sets.
   1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock*f*unlock trim control, latchbolt and lock*f*unlock status monitoring, deadbolt monitoring, and request−to−exit signaling. Support end−of− line resistors contained within the lock case. Unless otherwise indicated, provide electrified locksets standard as fail secure.
   2. Manufacturers, (basis of design):
      a. Sargent Manufacturing (SA) − 8200 Series.

B. Electromechanical Multi−Point Locks: Vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual mounted outside lever trim controls available in a variety of ANSI*f*BHMA operational functions. Option for single top latching only eliminates the need for bottom strikes. Electromechanical options include solenoid activated trim, electric latch retraction, and inside and outside lever monitoring.
   1. Manufacturers, (basis of design):
      a. Sargent Manufacturing (SA) − 7000 Series.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.9 AUXILIARY LOCKS

A. Mortise Deadlocks, Small Case: ANSI*f*BHMA A156.36, Grade 1, small case mortise type

deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

1. Manufacturers, (basis of design):
    a. Sargent Manufacturing (SA) − 4870 Series.
    b. Substitutions: See Section 01 6000 - Product Requirements.

2.10 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat−Lip Strikes: For locks with three−piece antifriction latchbolts, as recommended by manufacturer.
2. Extra−Long−Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum−Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Short−lipped strikes: For locks at double doors.

B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.11 ELECTROMAGNETIC LOCKING DEVICES

A. Surface Electromagnetic Locks (Extra Heavy Duty): Electromagnetic locks to be surface mounted type tested to ANSI A156.23, Grade 1 with minimum holding force strength of 1,800 pounds. Locks to be capable of either 12 or 24 voltage and be UL listed for use on fire rated door assemblies. Electronics are to be fully sealed against tampering and allow exterior weatherproof applications. As indicated in Hardware Sets, provide specified mounting brackets and housings. Power supply to be by the same manufacturer as the lock with combined products having a lifetime replacement warranty.
1. Manufacturers, (basis of design):
    a. Securitron (SU) − M82 Series.
    b. Substitutions: See Section 01 6000 - Product Requirements.

2.12 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
3. Except on fire rated doors, provide exit devices with key cylinder dogging device to hold

the pushbar and latch in a retracted position.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
5. Flush End Caps: Provide flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru−bolts.
   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Extended cycle test: Devices to have been cycle tested 50 million cycles.
11. Rail Sizing: Provide exit device rails factory sized for proper door width application.
12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI*f*BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
   1. Manufacturers, (basis of design):
      a. Sargent Manufacturing (SA) − 80 Series.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.13 ELECTROMECHANICAL EXIT DEVICES

A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI*f*BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.
   1. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.
   2. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.
   1. Manufacturers, (basis of design):
      a. Sargent Manufacturing (SA) − 80 Series.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.14 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:
   1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non−handed with full sized covers.
   2. Standards: Closers to comply with UL−10C for Positive Pressure Fire Test and be U.L.

listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles.
4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC*ƒ*A117.1.
5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through−bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI*ƒ*BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non−critical valves for closing sweep and latch speed control.

1. Manufacturers, (basis of design):
   a. Sargent Manufacturing (SA) − 281 Series.
   b. Substitutions: See Section 01 6000 - Product Requirements.

2.15 ELECTROHYDRAULIC DOOR OPERATORS

A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.
   a. Fire−Rated Doors: Provide door operators for fire−rated door assemblies that comply with NFPA 80 for fire−rated door components and are listed and labeled by a qualified testing agency.

B. Standard: Certified ANSI*ƒ*BHMA A156.19.

C. Performance Requirements:
   a. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
   b. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.

D. Configuration: Surface mounted or in−ground as required. Door operators to control single swinging and pair of swinging doors.

E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI*ƒ*BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.

F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.

G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and

specified auxiliary contacts.

H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.
   1. Manufacturers, (basis of design): Subject to compliance with requirements, provide products by one of the following:
      a. Norton Door Controls (NO) − 6000 Series.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.16 SURFACE MOUNTED CLOSER HOLDERS

A. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder*ƒ*releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.
   1. Manufacturers, (basis of design):
      a. Rixson (RF) − 980*ƒ*990 Series.
      b. Sargent Manufacturing (SA) − 1560 Series.
      c. Substitutions: See Section 01 6000 - Product Requirements.

2.17 ARCHITECTURAL TRIM

A. Door Protective Trim
   1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
   2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
   3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
   4. Protection Plates: ANSI*ƒ*BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
      a. Stainless Steel: 300 grade, 050−inch thick.
   5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
   1. Manufacturers, (basis of design):
      a. Hiawatha, Inc. (HI).
      b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
      c. Trimco (TC).
      d. Substitutions: See Section 01 6000 - Product Requirements.

2.18 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI*ƒ*BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor

stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers, (basis of design):
    a. Hiawatha, Inc. (HI).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).
    d. Substitutions: See Section 01 6000 - Product Requirements.

C. Overhead Door Stops and Holders: ANSI*f*BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non−handed design with mounting brackets as required for proper operation and function.

2. Manufacturers, (basis of design):
    a. Rixson Door Controls (RF).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Sargent Manufacturing (SA).
    d. Substitutions: See Section 01 6000 - Product Requirements.

2.19 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non−corrosive fasteners and elsewhere where indicated.

B. Coordinate thresholds with Sill details and field conditions.

C. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

D. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL−10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

E. Sound−Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

F. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

1. Manufacturers, (basis of design):
    a. National Guard Products (NG).
    b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
    c. Reese Enterprises, Inc. (RE).
    d. Substitutions: See Section 01 6000 - Product Requirements.

2.20 ELECTRONIC ACCESSORIES

A. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be

expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and ƒor individually protected, relay controlled outputs.

1. Manufacturers, (basis of design):
   a. Securitron (SU) − AQD Series.
   b. Substitutions: See Section 01 6000 - Product Requirements.

2.21 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.22 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSIƒBHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 − EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSIƒDHI A115 series.

B. Wood Doors: Comply with ANSIƒDHI A115−W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

   1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking dev ices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

   1. Hardware for Standard Steel Doors and Frames."
   2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for

Wood Flush Doors."

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1
4. "Accessibility Guidelines for Buildings and Facilities."
5. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Power Operator products and accessories are required to be installed through current members of the manufacturer's "Power Operator Preferred Installer" program.

D. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealers."

F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.5 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.6 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.7 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

B. Manufacturer's Abbreviations:
1. MK − McKinney
2. OT − Other
3. PE − Pemko
4. MR − Markar
5. RO − Rockwood
6. SA − SARGENT
7. SU − Securitron
8. MC − Medeco
9. RF − Rixson
10. NO − Norton

Hardware Sets

QTY	Description	Model #	Finish	MFG
Set: 01.0				
Description: Egress Stair Pair - Passage, Hold Open				
2	Continuous Hinge	FM3500	630	MR
2	Exit Device (SVR,LBR,passage)	12 NB8715 ETL	US32D	SA
2	Door Closer	281 O or P10	EN	SA
2	Kick Plate	K1050 10" 4BE CSK	US32D	RO
2	Electromagnetic Holder **	998M (or to suit details)**	689**	RF **
2	Door Stop	401; 404; 441CU (or per spec)	US26D	RO
1	Head & Jamb Gasketing	S88BL		PE
1	Astragal (adhesive, edge mount)	S771C		PE

Notes: Interface with building fire alarm system and remote security switch to release door(s) from hold open.

**The existing doors have existing floor-mounted electromagnetic holders. The design intent is to re-use the existing holders with the new doors. Please include an allowance for labor and material costs per door to modify the existing electromagnetic holders as required for re-use. If an investigation in the field determines that the existing electromagnetic holders cannot be re-used, furnish and install the new electromagnetic holders as noted in the hardware set.

END OF SECTION 08 71 00

SECTION 08 8100
GLASS AND GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide glazing materials and installation components and accessories where scheduled, as shown on the drawings and specified in this section.

B. Work of this Section is affected by Alternate. See Section 01 2300.

C. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Windows
2. Doors
3. Glazed entrances
4. Glass railings

D. Related Sections include the following:

1. Section 08 1100 Hollow Metal Doors and Frames
2. Section 08 3100 Access Doors and Panels
3. Section 08 4900 Sound Control Doors and Frames
4. Section 08 6300 Metal Framed Skylights

1.3 DEFINITIONS

A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or Argon gas where needed to meet performance criteria.

1. The contractor shall indicate in the pre-contract documents if Argon-filled insulating glass may be required to meet the performance criteria in these specifications.
2. The architect reserves the right to require additional testing and additional warranty coverage for insulating glass using argon gas.

C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the fabricator's design and manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

D. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the fabricator's design and manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

E. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the fabricator's design and manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal, and specified thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, and/or product imperfections, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; and engaged deterioration of glazing materials; or other defects in construction.

1. Provide glass thickness and kind (Annealed, Heat Strengthened, Fully Tempered) as required to meet design criteria, and codes of governing agencies having jurisdiction.
2. Units must resist temperature stress breakage. Provide Heat Strengthened glass where annealed glass would be subject to breakage.
3. There shall be no spontaneous breakage of glass.

B. Work shall conform to the most current edition of following standards and codes. Where contradictory requirements are found between standards and/or codes and/or this specification, the more stringent requirement shall govern unless otherwise stated by the Architect.
1. Rhode Island State Building Code
2. AAMA 101/1.S.2-97 "Voluntary Specification for Aluminum, Vinyl (PVC) and wood windows and Doors
3. IWCA I-14 .1-2001 Window Cleaning Safety
4. ANSI Z97.1 American Nation Standard for Safety Glazing Materials Used in Buildings
5. GANA Glass Association of North America Glazing Manual

C. Glass Design: Glass thickness indicated is minimum and for detailing only. Confirm glass thickness by analyzing project loads and sizes, and in-service conditions. Provide glass lites for

various size openings in nominal thickness indicated, but not less than thickness and in strengths (annealed or heat treated) required to meet or exceed the project area design and Building Code criteria:

D. Glass Thickness: Select minimum glass thickness to comply with ASTM E 1300, according to the following requirements:

1. Design Loads: Glass shall be designed integrally with the framing system to resist design loads. Refer to the following sections for applicable loads:
   a. 08 1100 for Hollow Metal Doors and Frames
   b. 08 3100 for Access Doors and Frames
   c. 08 4900 for Sound Control Doors and Frames
   d. 08 6300 for Metal-Framed Skylights

E. Maximum lateral deflection normal to the plane of the wall: At full design load for glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to L/175 times the short side length or 3/4 inch, whichever is less, when tested at the design wind pressure per ASTM E330, except, increase the maintained 10 seconds duration test loads in ASTM E330, to 60 seconds. Deflection shall not reduce the edge bite to less than 3/8-inch under full design load.

F. Deflection parallel to the plane of the wall: At full dead load, or wind pressure, deflection shall not exceed an amount that will reduce bite below 75% of the design dimension and shall not reduce the edge clearance between a framing member and the glass panel to less than 3/8-inch.

G. Minimum thickness of glass lites, whether annealed or heat treated, are to be selected so that the worst case probability of failure does not exceed the percentages listed in the State Building Code.

H. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

I. Acoustic Performance: It is the objective of this specification that suitable and qualified manufacturers supply and install glazing systems specified within this document and elsewhere, to achieve the strict requirements of maximum allowable noise transmission.
1. Not less than the following OITC sound transmission loss ratings according to ASTM E 1425 and determined by ASTM E 413. OITC results are valid for outdoor applications in preventing exterior noise. The number is expressed in decibels (dBA).
   Window Type C OITC 25 – Glass Type C OITC 30.

J. Thermal Performance: As indicated on Drawings.

1.5 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Samples: For the following products, in the form of 12-inch- square samples for proposed glass types and of 12-inch- long Samples for sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

1. Annealed, heat strengthened, heat treated, etc., types.
2. Coated vision glass.
3. Each type of laminated glass with interlayer.
4. Insulating glass for each designation indicated.
5. For each color (except black) of exposed glazing sealant and gasket indicated.
    a. Apply sealant or gasket between two strips of the material with the same colors and finishes that will be used in the final installation.

C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thickness for each size opening and location. All window glass shall have the same interior and exterior lite configuration.

D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Preconstruction Adhesion and Non-staining Compatibility Test Report (refer to test requirements in the Quality Assurance paragraphs of this specification): Provide test reports from glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

G. Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
1. Insulating glass.
2. Glazing sealants.
3. Glazing gaskets.
4. Single Glass.

H. Submittals related to Acoustic performance: The manufacturer of window and glazing systems shall submit independent laboratory test data substantiating that all configurations of glazing to be supplied to the subject project satisfy the Sound Transmission Loss Performance requirements stated in the preceding section when tested in accordance with ASTM E 90-04 and ASTM E 1332-90.

1. Should such independent test data not be available, or if it is not available for exact window configurations to be utilized on the subject project in terms of size, materials

and construction, then a series of witnessed acoustical laboratory tests shall be conducted at the window manufacturer's expense to satisfy the acoustical performance requirements detailed in this specification. Such tests shall be conducted upon all configurations of glazing assemblies to be supplied to the project. Such tests shall be conducted in accordance with ASTM E 90-04 and in the presence of the project architect and acoustical consultant.

All costs associated with this testing and including those associated with relevant consultant's time and expenses shall be borne by the window manufacturer/supplier. Should the tests not show compliance with the acoustical performance requirements, then all additional necessary measurements and retesting shall be undertaken by the manufacturer/ supplier until such requirements are achieved.

I. Warranties: Special warranties specified in this Section.

J. Submit calculations for the following:

1. Thermal stress calculations for each type.
2. Glass manufacturer's substantiating calculations or data showing probability of breakage, at the design wind pressure and temperature variations will not exceed the specified probability of breakage for each type, size and thickness.

K. Submittals are required to document NECHPS Certification requirements for all installed products and materials. See Section 01 33 00.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations for Clear Glass: Obtain clear float glass from one primary-glass manufacturer.

1. Fabricator to have minimum 5 years experience.

C. Source Limitations for Coated Glass: Obtain coated glass from one manufacturer for each type of coating and each type and class of float glass indicated.

D. Source Limitations for Insulating Glass: Obtain insulating-glass units from one manufacturer using the same type of glass and other components for each type of unit indicated.

E. Source Limitations for Laminated Glass: Obtain laminated-glass units from one manufacturer using the same type of glass lites and interlayers for each type of unit indicated.

F. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

G. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.

1. Glass Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

H. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.

1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion- in-peel, and indentation hardness.

I. Preconstruction Adhesion and Non-staining Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape, sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.

1. Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.

    a. Perform tests under normal environmental conditions replicating those that will exist during installation, (72deg. F with 50% relative humidity).

2. Submit not fewer than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, and insulating units) as well as one sample of each glazing accessory (gaskets, tape sealants, setting blocks, and spacers).
3. Schedule sufficient time for testing and analyzing results to prevent delaying the work.
4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
5. Testing will not be required if elastomeric glazing sealant manufacturers submit and certify data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

J. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to the Architect, for fire ratings indicated, based on testing according to NFPA 257.

K. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.

L. Provide safety glass where required to satisfy structural requirements, resist human impact loads and as otherwise required by Codes and Standards. Glass panels subject to human impact loads include glass in doors, fixed panels in windows and doors that may be mistaken for means of egress or ingress, where lowest point of panel is less than 18” above finished floor and minimum panel dimension is larger than 18”.

M. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines

N. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:

1. Insulating Glass Certification Council.

O. Design Criteria: Limit the statistical probability of failure to eight lites per thousand, typical, one lite per thousand for skylights, at design wind pressures based upon 60 second uniform load.
1. Mockups: Before glazing, build mockups for each glass product indicated below to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Install glazing in mockups.

P. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F.

1.9 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, delivered to a secure location on site within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, delivered to a secure location on site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

D. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating- glass units that deteriorate as defined in "Definitions" Article, delivered to a secure location on site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

E. Manufacturer's Special Warranty on Single Glass (tempered plain vision glass): Written warranty made out to Owner and signed by single-glass manufacturer agreeing to furnish replacements for single-glass units that deteriorate as defined in "Definitions" Article, delivered to a secure location on site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

F. Fabricator of insulating glass assemblies which contain, “Low-E”, coatings, decorative ceramic frit coatings, metallic coatings and/or laminated glass within assemblies shall assume responsibility for all coater and laminator suppliers warranties (if not performed by the fabricator) specified herein and shall issue a single source warranty for the entire insulating glass assembly.

G. Manufacturer's Special Warranty on tempered glass: Written warranty made out to Owner and signed by tempered glass manufacturer agreeing to furnish replacements units and pay the

cost of installation of units that fail due to spontaneous breakage. Units shall be delivered to a secure location on site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLAZING SYSTEMS, GENERAL

A. Unless specific products are designated as proprietary, it is intended that each type of glazing system be selected by the fabricator for the individual systems for windows and doors, storefronts and entrances, etc.

1. Glazing systems may be wet- sealant installations, dry- gasket installations, or combination- wet/dry, installations. Select from glazing materials indicated in the Schedule at the end of Part 3, subject to the specific limitations indicated, and results of required adhesion and compatibility testing.

B. Design glazing system in aluminum windows so that vision panels are replaceable from inside the building re-using existing framing, gaskets, and similar accessories and from the exterior where accessibility is limited to the exterior only for replacement.

C. Specialty interior glazing: Provide frosted, sandblasted and coated glazing at interiors as indicated on finish schedule. Match Architect's samples for finishes.

2.2 PRIMARY FLOAT GLASS

A. Low Iron Float Glass: Starphire Ultra Clear or equal, ASTM C 1036, Type I (ultra clear transparent glass, flat), Quality q3 (glazing select); Class 1.

2.3 HEAT STRENGTHENED, AND FULLY TEMPERED GLASS

A. General: Glass which has been heat treated horizontally; maintain roller marks running horizontally in the final installation whenever possible. For glass which has been heat treated vertically¸ locate tong marks along an edge, oriented in the same direction which will be concealed in the glazing system.

1. Overall Bold and warp tolerances: Heat treated glass shall be examined by the glass manufacturer to detect and discard any lites which exceed 50% maximum bow in any direction, as listed ASTM C1048 Tables.
2. Roll ripple tolerances: Where heat treatment process results in essentially parallel ripples of waves, the deviation from flatness at any peak shall not exceed 0.005 inches.
3. Quench marks to shall be consistently oriented horizontally.
4. Incorporate the heat soak process to control nickel sulfide inclusions and reduce risk of spontaneous breakage of installed glass. Heat soaking shall be performed per EN 14179-1:2005– European Heat Soaking Standard.

5. Comply with ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.

2.4 LOW-E COATED GLASS

A. General: Provide coated glass complying with requirements indicated in this Article.

1. Provide Kind FT (fully tempered) where coated safety glass is indicated.

B. Sputter-Coated Float Glass: Float glass with metallic-oxide or metallic-nitride coating deposited by vacuum deposition process after manufacture and heat treatment (if any), complying with requirements specified.

C. See glass schedule for name of coating.

2.5 LAMINATED GLASS

A. Laminated Glass: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified.

B. Interlayer: Interlayer material as indicated below, clear or in colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

1. Interlayer Material: Polyvinyl butyral sheets.
2. Laminate material at edges, not to be exposed to UV light or deterioration
3. Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.

C. Safety glass shall have permanent marking sandblasted or ceramic frit logo.

2.6 INSULATING GLASS

A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying ASTM E 2190 for certification by IGCC. and with requirements specified in this Article.

1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

B. Interspace: dehydrated air or Argon gas where needed to meet performance criteria

C. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.

D. Sealing System: Dual seal, with primary and secondary sealants as follows:

1. Polyisobutylene and silicone.

E. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:

1. Aluminum with custom finish, as selected by Architect
2. Desiccant: Molecular sieve or silica gel, or blend of both.
3. Corner Construction: Welded or bent.
4. Alternate Spacer (where necessary to meet thermal performance criteria): thermally broken aluminum spacer by Azon

2.7 GLASS SCHEDULE

A. General: the following descriptions include minimum thicknesses and strengths of glass required and interspace gas. Where thicker or stronger glass, or argon gas fill is required to meet the performance criteria herein, including acoustic performance, wind loads and thermal stress it shall be provided by the contractor at no additional cost. “Types” indicated below refer to acoustic performance requirements.

B. Safety Glass: The glass types in this schedule shall be modified to include Fully Tempered (FT) safety glass where indicated and at doors and locations where edge of glass is within 18” of surface used by pedestrians.

C. Glass Types (consider the below for performance only – refer to drawings):

1. G1: 60 min Fire Rated FireLite Plus FE Glass or equivalent.
   a. 5/16" clear glass product rated for 60 minutes with 5-year limited Warranty.
   b. ANSI Z97.1
   c. CPSC 16 CFR1201 (Cat.I and II)

2. G2: 9/16" LAMINATE SAFETY GLASS W/ WHITE PVB INTERLAYER
   a. Inner Lite: 1/4” Type I (transparent glass, flat) Class 1, clear, float glass. Kind HS (heat strengthened) or FT (fully tempered)
   b. Frosted white PVB innerlayer
   c. Outer Lite: 1/4” Type I (transparent glass, flat) Class 1, clear, float glass. Kind HS (heat strengthened) or FT (fully tempered)

3. G3: 1 3/16" INSULATED "SENTRY" GLASS
   a. Inner Lite: 7/16” laminated (2 layers 3/16" glass with .06 SentryGlas inonoplast innerlayer) clear, float glass. Kind HS (heat strengthened) or FT (fully tempered)
   b. 1/2" sealed air space
   c. Outer Lite: 1/4” Type I (transparent glass, flat) Class 1, clear, float glass FT (fully tempered)

2.8 GLAZING SEALANT

A. Medium-Modulus Neutral-Curing Silicone Glazing Sealant: Provide products complying with the following:

1. Products: Provide the following, (as basis of design), or equal as approved by the architect:
   a. Dow 795 Dow Corning.
   b. GE Silpruf SCS2000
   c. Pecora 895 NST
   d. Substitutions: See Section 01 6000 - Product Requirements.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.
   a. Use O Glazing Substrates: Coated glass, color anodic aluminum, aluminum coated with a high-performance coating.
6. Applications: General glazing applications, particularly those for large lights and similar applications where additional movement capability is required.

2.9 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.

B. Elastomeric Glazing Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied, chemically curing sealant in the Glazing Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

1. Additional Movement Capability: Where additional movement capability is specified in the Glazing Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements in ASTM C 920 for uses indicated.

C. Glazing Sealant for Fire-Resistive Glazing Products: Identical to product used in test assembly to obtain fire-protection rating.

2.10 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based, (silicone sealant at all butyl tape exposed to UV light) elastomeric tape with a solids content of 100 percent; non-staining and non-migrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where interior use where indicated.
2. AAMA 806.3 tape, for general glazing applications, all exterior and applications in which tape is subject to continuous pressure.
3. Alternate: Silicone tape.

B. Expanded Cellular Glazing Tape: Closed-cell, PVC foam tape; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:

1. Silicone tape (only) for glazing applications in which tape acts as the primary sealant.
2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.11 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
1. Peroxide-cured EPDM, ASTM C 864.
2. Silicone, ASTM C 1115.
3. Thermoplastic polyolefin rubber, ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:

1. Neoprene or Santoprene.
2. Peroxide-cured EPDM.
3. Silicone.
4. Thermoplastic polyolefin rubber.

C. Provide molded corners, corner joints heat welded, at pressure equalized and sealed corners at all other locations.

2.12 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealants: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Silicone with a Shore A durometer hardness of 85, plus or minus 5.

D. Spacers: Silicone blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Silicone material of hardness needed to limit glass lateral movement (side walking), 50+/- Shore Durometer hardness.

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

G. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.

H. Mirror Accessories: Provide edge sealer that has proven compatibility with coating and is approved by the manufacturer for use in protection against silver deterioration at edges.

2.13 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing and glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.
5. Perimeter interior and exterior joint seals to support structure, air/water seals, and materials.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions, as indicated on drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thickness, with reasonable tolerances. Adjust and correct s required by project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply cleaners and primers to joint surfaces where required application and for adhesion of sealants, as determined by pre-construction sealant-substrate testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead. Install at 1/4 points unless otherwise instructed by the glass manufacturer.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Stops: Install and secure as indicated, after glazing has been set in frame. Do not exert excess force no glazing and spacers.

K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

Provide molded corners (corner joints heat welded) at pressure equalized and sealed corners at all other locations and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away. Seal corner joints and butt joints with sealant recommended by gasket manufacturer and seal horizontal and vertical metal extrusion to receive gasket at all corners.

3.4 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

B. Insert soft and hard compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners with joint seals and/or molded, welded corners.

C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weather tight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer. Seal horizontal and vertical metal extrusion to receive gasket at all corners.

D. Install gaskets so they protrude past face of glazing stops.

3.5 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.6 PROTECTION AND CLEANING

A. Protect exterior glass from damage by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer and GANA guidelines. Do not use razor blades, scrapers or other metal tools to clean glass.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. The work of this section includes, but is not limited to, the following:

1. Metal framing and trimming systems for drywall systems.
2. Gypsum boards for wall, ceiling and soffit applications.
3. Cementitious tile backer board, interior.
4. Plaster backer board.
5. Gypsum board finishes.
6 Sound attenuation insulation.
7. Concealed acoustical sealants.
8. Miscellaneous metal framing and blocking.
9. Installation of access panels.

B. Work of this Section is affected by Alternate. See Section 01 23 00.

1.3 RELATED WORK

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:

1. Section 06 10 00, Rough Carpentry; Blocking and wood studs.
2. Section 07 84 00, Firestopping; Fire-safing insulation and sealant.
3. Section 07 90 05, Joint Sealants; Exposed acoustical sealant.
4. Section 09 90 00, Painting; Finishing of work of this section.
5. Division 22, Plumbing, Division 23 - HVAC and Division 26 - Electrical; Coordination of mechanical, electrical, and plumbing requirements.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material used. Provide certifications stating that materials comply with requirements.

B. Samples: Provide three samples of textured ceiling finish showing full range of textures in

finished work.

C. Calculations: Provide professionally prepared calculations and certification of the performance of this work. Show how design load requirements and other performance requirements have been satisfied.

1.5 QUALITY ASSURANCE

A. Source: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturers of the primary materials.

B. Engineering and Structural Performance: Provide the services of a Professional Engineer, who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated, to design and certify that the work of this section meets or exceeds the performance requirements specified in this section.

1. Limit deflection to L/240 for non-rigid finishes, L/360 for rigid finishes applied over drywall. Lateral load is 10 p.s.f.

C. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by a qualified independent testing agency, acceptable to the Architect and authorities having jurisdiction.

D. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency, acceptable to the Architect and authorities having jurisdiction.

1. Acoustical performance of partitions is critical to the work of this section. Drawings indicate required STC ratings in partitions types. This includes partition types with dual stud framing for separation as well as partitions which include resilient isolation clips.

E. Mockups: Before finishing gypsum board assemblies, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and qualities of materials and execution.

1. Install mockups for each type of application.

2. Simulate finished lighting conditions for review of mockups.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products in unopened factory labeled packages. Store and handle in

strict compliance with manufacturers' instructions and recommendations. Protect from damage. Adequately support stored gypsum panels to avoid sagging. Sequence deliveries to avoid delays, but minimize on-site storage.

1.7 PROJECT CONDITIONS

A. Weather: Perform work only when existing and forecasted weather conditions are within the limits established by manufacturers of the materials and products used. Comply with requirements of Gypsum Association publication 220.

B. Framing Tolerances: Proceed with work only when framing work is complete and within installation tolerances specified in ASTM C754 and this specification section.

C. Ventilation: Comply with manufacturer's requirements and recommendations and Gypsum Association publication 216. Avoid too rapid drying in hot weather.

D. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Metal Framing and Support: Provide products of one of the following basis of design manufacturers if they meet or exceed the requirements of these specifications:
1. MarinoWare; Division of Ware Ind
2. Dietrich Industries, Inc.
3. National Gypsum Co.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Gypsum Board and Related Products: Provide products of one of the following basis of design manufacturers if they meet or exceed the requirements of these specifications:
1. Georgia-Pacific Corp.
2. National Gypsum Co.
3. USG.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.2 METAL FRAMING AND SUPPORTS

A. Studs: ASTM C645, 20 gage equivalent minimum (0.0190 inch thickness), unless otherwise recommended by manufacturer for conditions, span and deflection constraints indicated. Provide galvanized steel studs with not less than ASTM A 653, G40, hot-dip galvanized zinc coating.

1. Depth: 4", unless otherwise indicated on drawings or by span and deflection constraints.
2. Spacing: 16" o.c. unless otherwise indicated on drawings or by span and deflection

constraints.

B. Runners: Match studs. Provide type as recommended by stud manufacturer. Provide deflection track at head.

C. Furring: ASTM C 645, 25 gage, except 20 gage where span exceeds 4'; hat shaped or Z-shaped as indicated or appropriate. Provide galvanized steel furring with not less than ASTM A 653, G60 coating. Where indicated or required to achieve sound transmission classifications, provide special resilient sound transmission reducing isolation clips: RSIC-01 as manufactured by PAC International or ISOMax as manufactured by Kinetics.

D. Cold Rolled Channels: 16 gage steel with factory applied black asphaltum paint coating.

E. Hanger Rods: Where required for loading or by local authorities, provide mild-steel rods, sized as required, hot-dip galvanized.

F. Flat Hangers: Where required for loading or by local authorities, provide mild-steel flat hangers, sized as required, hot-dip galvanized.

G. Angle-Type Hangers: Provide steel angles with legs not less than 7/8 in. wide, formed from 0.0635 in thick galvanized steel sheet conforming to ASTM A 653, G 90, with bolted connections.

H. Resilient Hangers: USG Interiors RC-1, Dietrich “RCSS” or “RCSN”, or approved equal.

I. Steel Flat Strap and Backing Plate: Steel sheet for blocking and bracing, in length and width as indicated, and with a minimum base metal (uncoated) thickness of 0.0179 inch thick.

2.3 GYPSUM BOARD

A. Gypsum Wallboard: ASTM C36.
1. Types: Fire-resistant type X and type C. Refer to Wall Partition Schedule on the Drawings. Provide mold resistant type at all exterior walls and at interior walls and ceilings of bathrooms, kitchens and other areas where moisture may be present.
2. Edges: Tapered.
3. Thicknesses: 5/8", and as indicated.

B. Tile Backer Units: Provide one of the following:
1. Cementitious: ANSI A118.9 and ASTM C 1325, cement-coated Portland cement, basis of design: USG Durock or Custom Building Products Wonderboard or approved equal, nominal 5/8 inch thick. Substitutions: See Section 01 6000 - Product Requirements.

C. Abuse Resistant Gypsum Panels (basis of design): Thickness as indicated on the Drawings. Provide the following or approved equal.
1. Provide at corridors and where noted on Drawings: U. S. Gypsum Co. "Fiberock VHI"

abuse resistant panels with "Very High Impact" resistance. Gypsum board panels faced with heavy weight paper face and liner, and with paper facing folded around the long edges; panels shall conform to ASTM C 36 and have an impact resistance of 175 ft. lbs. At fire-rated construction provide Type X Fiberock VHI. Substitutions: See Section 01 6000 - Product Requirements.

D. Water Repellant Soffit Boards: Thickness as indicated on the Drawings. Provide the following at exterior ceilings and soffits and at bathroom ceilings and wet areas.
   1. Basis of design: U. S. Gypsum Co. "Exterior Gypsum Ceiling Board " weather and sag resistant panels with specially treated gypsum core encased in chemically treated water-repellent paper; panels shall conform to ASTM C 1396 for exterior soffit board.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.4 METAL TRIMS AND ACCESSORIES

A. Provide the following basis of design USG trim and accessory types or Architect approved equals from a specified manufacturer:
   1. Corner Bead: USG No. 800.
   2. Control Joint: USG No. 093.
   3. Edge Trim: USG No. 200-A and 200-B for drywall. Series 400 trim is not acceptable.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Interior Work: Galvanized steel trim units of types specified.

C. Profiled reveals, angled and shaped corner trims: Factory-primed extruded aluminum reveal by Flannery, Fry Reglet, Pittcon (basis of design) or approved equal, sizes as indicated on the Drawings.

D. Control Joints: Provide control joints complying with ASTM C 1047 and requirements indicated below:
   1. Material: Steel sheet coated with aluminum or rolled zinc.
   2. Type: One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

E. Accessory for Curved Edges: Cornerbead formed of metal, plastic, or metal combined with plastic, with either notched or flexible flanges that are bendable to curvature radius.

2.5 JOINT MATERIALS

A. General: Comply with ASTM C475.

B. Tape: Provide perforated, cross-fiber paper or fiberglass reinforcing.

C. Joint Compound: Provide ready mixed vinyl compound, unless indicated otherwise.
   1. For Exterior Applications: Provide setting-type taping and setting-type, sandable topping compounds.

2.6 MISCELLANEOUS MATERIALS

A. Concealed Acoustical Sealant: Non-drying, non-hardening, non-bleeding, non-staining sealant complying with ASTM C919. Provide one of the following (basis of design):
   1. Pecora BA-98.
   2. Tremco Acoustical Sealant.
   3. USG Acoustical Sealant.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Sound Attenuation Insulation: ASTM C 665, Type I, formaldehyde free. At acoustical partitions, provide Knauf sound attenuating fire blanket or approved equal with 2.5 lbs/cu.ft density meeting fire characteristics. Provide clips or wires to hold insulation in place as applicable.

C. Laminating Adhesive: Use joint compound or adhesive that is recommended by gypsum board manufacturer for laminating gypsum boards.

D. Screws: Comply with ASTM C646 and C514. Type S, bugle head, for attaching gypsum panels to steel framing. Provide other types as recommended by gypsum board manufacture. Provide cadmium plated fasteners for all fasteners in wet or humid areas.

E. Anchors: Provide screws, bolts, powder actuated fasteners, inserts and other fasteners that are customarily used in standard construction practices and which are proven capable of supporting at least 3 times design load.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Installer/Erector shall examine substrates, supports, and conditions under which this work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work means Installer accepts substrates and conditions.

3.2 INSTALLATION

A. General Requirements: Strictly comply with manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this section.
   1. Furniture Layout: Coordinate and guarantee dimensions required for custom millwork items fitting into wall construction.

B. Framing: Install/erect framing to comply with ASTM C754. Provide framing to comply with published details and recommendations of gypsum board manufacturer, or if not available, comply with U. S. Gypsum, Gypsum Construction Handbook. Erect ceiling framing system to comply with RS 5-16 supported only from building structure.

1. Do not bridge building joints; frame separately on both sides and allow for movement.
2. Isolate framing system from structural loading both horizontally and vertically.
3. Provide slip or cushioned joints at top of walls. Maintain lateral stability and acoustical performance.
4. Terminate partitions [framing and wallboard] at structural deck above, except as noted otherwise.
5. Where gypsum wallboard is noted to terminate above ceilings, continue framing to deck above.
6. Space framing members at 16"o.c., unless indicated otherwise. Meet deflection requirements.
7. Provide metal blocking at areas to receive rails, cabinets, window treatment, furnishings, shelving, and similar items requiring support unless indicated to receive wood blocking.
8. Isolate components of framing with resilient clips or separate dual framing as indicated on Drawings to achieve sound transmission classifications. Do not permit bridging or blocking to bridge sound separated or resilient isolation features of partitions.
9. Ensure maintenance of fire rating and acoustical rating at areas with built-in or recessed items such as fire extinguisher cabinets, furnishings and similar items.

C. Gypsum Board Installation: Install gypsum board in strict compliance with ASTM C 840 and Gypsum Association publication 216, Recommended Specifications for the Application and Finishing of Gypsum Board. Refer to partition schedule and details on the Drawings. Unless indicated otherwise, between offices one layer of gypsum board shall extend to structure above on each side of metal stud. Unless indicated otherwise, between offices and corridors, one layer of gypsum board shall extend to structure above.
   1. Locate joints between boards as far from center of walls and ceilings as possible.
   2. Stagger vertical joints on opposite sides of walls and in multiple layer work.
   3. Install gypsum boards with face side out and with joints over framing members.
   4. Do not butt dissimilar board edges.
   5. Provide one-piece boards around door and window frames.
   6. Cover both faces of stud partitions.
   7. Attach boards to metal framing with self-tapping, bugle head screws.
   8. Space fasteners as recommended by gypsum board manufacturer.
   9. Install drywall ceilings prior to gypsum board walls, to the greatest extent possible.
   10. In multiple layer walls, provide backing board or multiple layers of face board.
   11. Form control joints by preparing space between edges to receive metal control joint trim.
   12. Provide materials to maintain acoustical and fire rating of walls at built-in items such as fire-extinguisher cabinets.

D. Cementitious Backer Unit Installation: Install cementitious backer boards in strict compliance with ANSI A108.11 and manufacturer's requirements.

E. Metal Trim: Strictly comply with manufacturer's instructions and recommendations for installation of metal trims and accessories. Meet installation tolerance requirements.
   1. Provide corner bead trim at all external corners. Provide joint reinforcing tape at all

internal corners.
2. Provide control joints where shown and at less than 30' o.c. at locations approved by Architect.
3. Provide edge trim wherever edge of gypsum board is exposed, revealed, or sealant filled, or as noted on Drawings.

F. Acoustical Insulation Work: Provide sound attenuation insulation where indicated and where required to obtain STC ratings indicated. Use clips or wires to hold insulation in place. Stuff flutes in metal deck with acoustical insulation, except stuff flutes with firesafing insulation for fire-rated partitions.

G. Acoustical Sealing Work: Provide continuous bead of concealed acoustical sealant at both faces of top and bottom runner tracks, wall perimeters, openings, expansion and control joints. Close off all sound flanking paths and openings, including those above ceilings.

3.3 JOINT FINISHING

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
1. Extend joint finishing to floor behind wall base to provide a smooth flat surface for installation of wall base.
2. For water-resistant board applications, use special water-resistant joint compound to seal joints, cover fastener heads, fill surface defects and seal cut edges.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:

1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
2. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges where panels are substrate for tile and where indicated.
3. Level 5: At all exposed locations All joints and interior angles shall have tape embedded in joint compound and immediately wiped with a joint knife or trowel, leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound shall be trowel applied to the entire surface. Excess compound is immediately sheared off, leaving a film or skim coating of compound completely covering the paper.

E. Cementitious Tile Backer Units: Finish according to manufacturer's written instructions.

3.4 TOLERANCES

A. The following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Documents and shall not be added to allowable tolerances indicated for other work.
   1. Allowable Variation from True Plumb, Level, & Line: ± 1/8" in 20'-0".

B. After finishing joints and screw heads shall be flush and not visible. Surfaces shall appear truly flush, smooth, seamless and uniform. Planes shall be truly flat. Corners shall be crisp and at true angles. Where gypsum drywall work butts dissimilar materials, joints shall be tight and shall be accurately scribed to adjacent construction without gaps.

3.5 REPAIR

A. Repair minor damage to eliminate all evidence of repair. Remove and replace work which cannot be satisfactorily repaired. Clean up all joint compound splatters.

END OF SECTION

SECTION 09 6513
RESILIENT BASE AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Provide resilient wall base and accessories.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

C. Submit extra stock equal to 2% of total used.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Performance: Fire performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

A. Resilient Wall Base:
1. Type: TV (vinyl).
2. Group: I (solid, homogeneous)
3. Style: Cove.
4. Thickness: 0.125 inch
5. Height: 4 inches.

PART 3 EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Install in proper relation to adjacent work.

B. Install base and accessories to minimize joints. Install base with joints as far from corners as practical.

C. Clean, polish, and protect.

END OF SECTION

SECTION 09 9100
PAINTING & COATING

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Complete painting and finishing of new surfaces included in the Work.
   1. Surfaces that are left unfinished by other sections of Specifications shall be painted or finished as a part of this section.
   2. Copper, bronze, chromium plate, nickel, stainless steel, aluminum, Monel metal, lead, and lead coated copper shall not be painted or finished.
   3. Other surfaces not to be painted include items with factory applied final finish; concealed ducts and pipes; and plenums above suspended ceilings, except as noted otherwise.

B. Painting or finishing existing surfaces where scheduled or required as a result of alterations work.

1.2 RELATED SECTIONS:

A. Joint Sealers - 07 9005

B. Taping and bedding of gypsum board - 09 2116.

1.3 SUBMITTALS:

A. Product Data: Submit paint schedule in accordance with Section 01 3300. List each surface and its proposed paint products and systems, including manufacturer's name, product name and line number for each material.

1.4 QUALITY ASSURANCE:

A. Product Labels: Include manufacturer's name, type of paint, stock number, color and label analysis **on label of containers.**

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials in original containers with seals unbroken and labels intact.

B. Store materials and equipment in a single lockable area of project site. Provide adequate means to protect floors and adjacent surfaces of this area from damage.

C. Store rags, paint, and solvents in closed metal containers located in designated area.

D. Comply with applicable health and fire regulations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Except as otherwise specified, materials shall be products of the following manufacturers (basis of design):
   1. ICI Paint Stores. (ICI)
   2. Pittsburgh Paints. (PPG)
   3. Pratt and Lambert, Inc. (PL)
   4. Sherwin-Williams Co. (SW)
   5. Substitutions: See Section 01 6000 - Product Requirements.

B. Materials selected for coating systems for each type surface shall be product of a single manufacturer, unless otherwise specified

2.2 MATERIALS:

A. Select products from Material List below. Select primary products of a single manufacturer for each coating or paint system, unless otherwise specified.

B. Secondary products such as linseed oil, turpentine and shellacs shall be first line quality products of a reputable manufacturer.

C. Colors: As indicated.

D. Paint Material List (basis of design):

Substitutions: See Section 01 6000 - Product Requirements.

1. Ornamental Metal Primer:

   SW, Pro Industrial Pro-Cryl Primer, B66-310 Series

   a. Or approved equal.

2. Interior Galvanized Metal Primer:

   SW, Pro Industrial Pro-Cryl Primer, B66-310 Series

   a. Or approved equal.

3. Interior Wood Primer:

   SW, ProBlock Primer, Interior Oil Based, B79W8810

   a. Or approved equal.

   b. To be applied off site.

4. Interior Drywall Primer:

   SW, ProMar 200 Zero VOC Latex Primer, B28W2600

   a. Or approved equal.

4. Alkyd Satin Enamel:

   SW, Pro-Green 200 Alkyd Semi-Gloss Enamel, Low or Zero VOC.

   a. Or approved equal.

5. Latex Eggshell Enamel:

   SW, Pro-Industrial Zero VOC Acrylic Eg-Shel, Series B66-600, Zero VOC.

   a. Or approved equal.

6. Latex Flat Wall Paint:

   SW, Pro-Mar 200 Latex Flat Wall Paint, Series B30-200, Zero VOC.

   a. Or approved equal.

7. Latex Semi-gloss Paint:

   SW, Pro-Industrial Zero VOC Acrylic Semi-Gloss, Series B66-650, Zero VOC.

   a. Or approved equal.

8. Latex Flat Wall Paint: - Fire retardant

   SW, Pro-Mar 200 Latex Flat Wall Paint, Series B30W200. Low or Zero VOC.

   a. Or approved equal.

9. Conversion Varnish:

   SW, Kem Var, Dull Sheen.

a. Or approved equal.
b. To be applied offsite.

10. Texture Paint: USG Sheetrock Wall and Ceiling Spray Texture Finish.
11. Wood Stain:

SW, Wood Classics, Interior Oil Stain, Series A49-200

a. Or approved equal.
b. To be applied off site.

12. Wood Varnish:

SW, Wood Classics, Waterborne, Polyurethane Varnish, Series A68 Series

a. Or approved equal.
b. To be applied off site.

2.3 MIXING AND TINTING:

A. Accomplish job site tinting and mixing only when approved by Architect. Use tinting colors recommended by paint manufacturer for specific type of finish.

B. Thin paints only when specifically allowed by manufacturer; do not exceed thinning directions.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence, or quality of finish work, and which cannot be put into an acceptable condition through normal preparatory work.

B. Do not proceed with surface preparation or coating applications until conditions are suitable.

Application of paint or finish to surfaces shall constitute acceptance of that surface.

3.2 GENERAL APPLICATION REQUIREMENTS:

A. The intent of these Specifications is to produce highest quality appearance of paint and finish surfaces. Employ skilled mechanics only.

B. Finish tops, bottoms, and edges of doors same as balance of doors after they are fitted.

C. Clean surfaces free of foreign matter before applying paint or finishes.

D. Maintain ambient temperature in building of not less than 60°F. for 24 hours prior to and minimum of 24 hours after interior painting.

E. Provide a minimum of 20-foot candles illumination for surfaces to be painted or finished.

3.3 PREPARATION OF SURFACES:

A. Remove dirt, dust, oil, grease, and other contaminants from surfaces to be painted.

B. Sand woodwork smooth and clean surface before finishing.

C. Paste wood filler, applied on open grain wood, when set shall be wiped across grain of wood, then with grain to secure a clean surface.

D. Coat surfaces to be stained with a uniform coat of stain and wipe excess off.

E. Sand enamel and varnish finish on wood between coats using a fine sandpaper to produce an even, smooth finish. Thoroughly clean surfaces.

F. Wash metal surfaces with mineral spirits to remove dirt, oil, or grease before applying primer. Remove rust or scale by wire brushing or sanding clean before painting. Clean marred shop coats and touch up with primer.

G. Pretreat galvanized metal surfaces as recommended by paint manufacturer.

H. Fill scratches, cracks, and abrasions in gypsum board with a spackling compound flush with adjoining surface. Remove ridges and other protrusions by scraping flush with surfaces. When dry, sand smooth and seal before application of priming coat.

I. Properly prepare existing surfaces required to be repainted. Remove loose, chipped or cracked existing paint. Thoroughly clean surfaces prior to painting. Fill and sand cracks and depressions. Lightly sand existing metal surfaces.

J. Provide full primer/sealer coat on existing painted surfaces unless specified finish coat material is compatible with existing paint.

K. Completely remove existing finish on existing wood doors scheduled to be refinished.

L. Fill and sand metal door frames to provide a smooth surface before finishing. Touch-up factory prime coat before applying first coat.

M. Touch-up shop coats on metal surfaces before applying finish.

3.4 APPLICATION:

A. Final coat of paint shall have visual evidence of solid hiding and uniform appearance, and shall be smooth, free of brush marks, streaks, sags, runs, laps, or skipped areas.

B. Apply paint with suitable brushes, rollers, or spray equipment, as recommended by manufacturer.

C. Allow previous coats to thoroughly dry before applying succeeding coats.

D. Edges of paint adjoining other materials or colors shall be sharp and clean with no overlapping.

E. Slightly vary color of successive coats.

F. Adjust transparent finishes to obtain matching appearance between new and existing doors.

G. Sand and dust between each coat to remove visual defects.

H. Apply each coat of paint uniformly to minimum wet film (MWF) thickness specified in schedule below, or as recommended by manufacturer.

3.5 CLEANING AND PATCHING:

A. Upon completion of work, remove paint spots from floor, glass, and other finished surfaces. Remove from premises rubbish and accumulated materials. Leave work in clean, orderly, and acceptable condition.

B. Spot painting will be allowed to correct soiled or damaged paint surfaces only when touch-up spot will blend into surrounding finish and is invisible to normal viewing. Otherwise, re-coat entire section to corners or visible stopping point.

3.6 PROTECTION:

A. Protect completed finish and painting work, and protect adjacent finish surfaces from paint splatter, spills and stains.

B. Use adequate drop cloths and masking procedures during progress of work.

3.7 SCHEDULE OF PAINTING:

A. Interior Hollow Metal Frames:

Touch up shop primer or existing paint.

1st coat - Alkyd Satin Enamel (MWF 2.9 mils)

2nd coat - Same (Omit on existing frames).

B. Interior Metals:

1st coat - Ornamental Metal Primer (MWF 3.6 mils)

2nd coat - Alkyd Satin Enamel (MWF 2.9 mils)

C. Interior Galvanized Metals:

1st coat - Interior Galvanized Steel Primer (MWF 3.6 mils)

2nd coat - Alkyd Satin Enamel (MWF 3.6 mils)

D. Interior Wood - Transparent Finish (Existing Doors):

Completely remove existing finish down to bare wood. Apply new finish as follows:

Light stained conversion varnish finish, dull rubbed sheen, closed grain effect (AWI System TR-2/TR-4, Premium Grade).

1st coat - Paste Filler

2nd coat - Wood Stain to match existing

3rd coat - Sealer (Sand w/222 grit)

4th coat - Conversion Varnish (MWF 3.2 mils)

5th coat - Same

E. Interior Wood - Transparent Finish (New Doors):

Light stained conversion varnish finish, dull rubbed sheen, closed grain effect (AWI System TR-2/TR-4, Premium Grade).

1st coat - Paste Filler

2nd coat - Wood Stain to match existing

3rd coat - Sealer (Sand w/222 grit)

4th coat - Conversion Varnish (MWF 3.2 mils)

5th coat - Same

F. Gypsum Board Walls:

1st coat - Texture Paint - apply with roller to match existing texture

2nd coat - Latex Eggshell Enamel (MWF 3.6 mils)

3rd coat - Same

G. Gypsum Board Ceilings:

1st coat - Texture Paint - apply with roller to match existing texture

2nd coat - Latex Interior Flat Wall Paint (MWF 4.0 mils)

H. Fire Retardant Plywood Wall Panels:

1st coat - Latex Interior Flat Wall Paint - Fire Retardant (MWF 4.8 mils)

2nd coat - Same

END OF SECTION

SECTION 21 13 00
AUTOMATIC SPRINKLER SYSTEMS

1.0 GENERAL

1.1 Related Documents

A. Drawings, Hydraulic Calculations, and general provisions of the Contract and Agreement apply to this Section.

B. See Hydraulic Calculations following specification.

1.2 Summary

A. This specification applies to the installation of the automatic sprinkler system at the Charles E. Shea High School in Pawtucket, RI.

B. Drawings supplied with this specification shall be used as a reference for the requirement and location of system components. Work includes coordinating with other trades and confirmation of the required quantities of equipment and specific options for locations of the same.

C. At the time of bid, all exceptions taken to these Specifications, variances from these Specifications and all substitutions of equipment specified shall be listed in writing and forwarded to Jensen Hughes (Engineer) via the general contractor. For equipment substitutions, the “Request for Alternative Manufacturer” form shall be submitted. Any such exceptions, variances, or substitutions, which were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment.

D. Refer to the overall bid package for the overall scope of the project.

E. The Work includes all labor, materials, tools, transportation, and temporary construction necessary to design, fabricate, install, test and flush a fully operational and code compliant, automatic wet-pipe sprinkler system as follows:
   1. Installation of new fire sprinkler system infrastructure to provide full sprinkler coverage throughout the building in accordance with NFPA 13.
   2. Maintain all existing sprinkler system infrastructure including the existing dedicated 6-inch fire protection service, backflow prevention assembly, fire department connection, standpipes, and risers, unless other wise noted.
   3. Maintain the existing partial coverage sprinkler system infrastructure serving the Basement Level, Gymnasiums, Auditorium, Pool, and Boiler Room.
   4. Modify the existing FDC infrastructure to accommodate a backflow flushing connection using a normal closed valve to bypass the FDC check valve.
   5. Install sprinklers under obstructions greater than 48 inches (ducts, structural members, mechanical equipment, etc.).
   6. Install sprinklers above finished ceilings where combustible building materials are present above.
   7. Install firestopping materials at all penetrations of fire-resistance rated walls and all floor/ceiling assemblies. Rated walls include but are not limited to corridor walls, mechanical and electrical rooms, exit stairs, storage rooms, and shafts.
   8. Sprinkler guards to be installed for all sprinklers below obstructions and where identified on the drawings.
   9. Replace and/or repair all systems impacted by the fire sprinkler scope of work.

F. Drawings supplied with this specification shall be used as a reference for the requirement and location of system components. Work includes visiting the site to observe the existing conditions, and confirmation of the required quantities of devices and specific options for locations of the same.

G. The Work includes all fees and activities required to secure approvals for necessary State and Local permits.

H. The Work includes submitting detailed Working Plans and Product Data to the Engineer for review prior to submitting same to local officials for approval and permit.

I. The Work includes submitting As-built Plans and closeout documentation to the Engineer for review prior to scheduling Owner demonstration training.

J. The Work includes training Owner's personnel on the operation of the system, required maintenance tasks and frequencies, and the locations of all spare tools and equipment, valves, flow switches, risers and equipment necessary to maintain and operate the sprinkler systems.

1.3 Performance Requirements

A. Wet-pipe, hydraulically calculated automatic fire sprinkler systems shall be installed in all areas of the building where the temperature is maintained at 40°F or higher at all times. Where indicated on the design drawings and where the temperature is not maintained at 40°F, dry sprinklers are to be installed.

B. A combination of recessed pendent and upright sprinklers shall be installed throughout the building as noted on the plans. All sprinklers installed shall be quick-response type unless otherwise noted or required by NFPA 13.

C. Water Flow Test Data; use the following:
1. Flow Test Date: October 9, 2024
2. Test Conducted by: Jensen Hughes & Pawtucket Water Supply Board
3. Flow Hydrant: D05-024
4. Flow: 1342gpm
5. Test Location: Existing Sprinkler Riser
6. Static Pressure: 71psi
7. Residual Pressure: 66psi

D. Pipe sizes for piping downstream and including floor control assemblies shall be determined by hydraulic calculations in accordance with NFPA 13. Verify that field modifications to the system, which require the addition of fittings and pipe, do not affect the hydraulic demand of the automatic fire sprinkler system.
1. If, given the available water supply as indicated above, the automatic fire sprinkler system cannot be designed in compliance with this specification and the applicable codes and standards, provide a report to the Owner documenting the design options that have been investigated. Additionally, copies of the hydraulic calculations, which demonstrate the inability of the water distribution system to supply the necessary water for the sprinkler system demand, shall be submitted for each option.

E. Sprinkler system shall be designed according to the following:
1. A minimum 5 psi margin of safety shall be provided between the residual water supply pressure and the required sprinkler system demand pressure at the calculated system design flow, including all hose allowances. This safety factor is only required for calculations conducted per NFPA 13 requirements.

F. Sprinkler Occupancy Hazard Classifications shall be as follows:
   1. Light Hazard
      a. Common corridors, offices, conference rooms, bathrooms, classrooms, etc.
   2. Ordinary Hazard, Group 1
      a. Misc. storage areas, janitor closets, mechanical equipment rooms, electrical equipment rooms, kitchens, boiler rooms, etc.

G. Minimum Density for Automatic Sprinkler System Piping Design:
   1. Light-Hazard Occupancy areas: 0.10 gpm/s.f. over 1,500 s.f. area.
   2. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm/s.f. over 1,500 s.f. area.
   3. Area of operation increases shall be included for sloped ceilings.
   4. The area reduction for quick response sprinklers per NFPA 13 shall be permitted.

H. Maximum Protection Area per Sprinkler:
   1. Light Hazard Areas: Approx. 225 s.f. standard spray pendent and 196 s.f. horizontal sidewall on all levels.
   2. Ordinary Hazard Groups 1 and 2 Areas: 130 s.f. standard spray pendent and standard spray upright and 100 s.f. horizontal sidewall on all levels.
   3. Sprinklers shall be spaced per NFPA 13 requirements.
   4. All obstruction rules shall be strictly adhered to. Additional sprinklers shall be added, where required for compliance with NFPA 13.

I. Calculate pressure loss due to elevation and friction loss through all fittings, pipes, valves and backflow prevention devices in accordance with NFPA 13.

J. Hose Allowance:
   1. A total inside and outside hose allowance of 100 gpm shall be required for light hazard occupancies.
   2. A total inside and outside hose allowance of 250 gpm shall be required for ordinary hazard occupancies.

K. Components shall be capable of producing piping systems with 175-psig minimum working pressure rating, unless otherwise indicated.

1.4 Order Of Precedence

A. Should conflicts arise out of discrepancies between documents referenced in this specification, the most stringent requirement shall apply; however, should a level of stringency be indeterminable, the discrepancies shall be resolved as follows:
   1. State and local codes shall take precedence over this specification.
   2. The National Fire Protection Association Standards shall take precedence over this specification.
   3. This specification shall take precedence over the drawings.

1.5 Submittals

A. Pre-Installation Documentation: Prepare and submit a complete submittal package to the general contractor to be distributed to Jensen Hughes for approval prior to submitting same to local officials for approval and permit. Resubmit portions or entirety of submittal to address Engineer comments prior to submitting package to local officials for approval and permit. The pre-installation submittal package shall include:
   1. Product Data: For each product specified in Part 2. Submittal shall indicate listing and approvals, selected options, finishes, etc. and electrical characteristics.

a. Contractor shall uniquely identify each item to be submitted, where multiple products or finishes are shown for a manufacturer's data sheet.

2. Working Plans: Minimum 1/8" = 1'-0" scale inclusive of information required by NFPA 13 requirements.
   a. Where Working Plans deviate from the signed construction documents prepared by Jensen Hughes, the Contractor shall submit Working Plans sealed and signed by a registered Professional Engineer (P.E.) in Rhode Island.
   b. A single Professional Engineer (P.E.) registered in Rhode Island shall be the Engineer of Record for the project, therefore, where the Contractor modifies any portion of the signed construction documents; all components of the Working Plans shall be sealed and signed by a single registered P.E. in Rhode Island.
3. Hydraulic Calculations: Prepared in accordance with NFPA 13 requirements. Minimum one (1) calculation for each hazard on each level. One (1) calculation required on highest level per hazard when pipe sizing and arrangement remains typical.
   a. Where the Hydraulic Calculations deviate from the signed construction documents prepared by Jensen Hughes, the Contractor shall submit Hydraulic Calculations sealed and signed by a registered Professional Engineer (P.E.) in Rhode Island.
   b. A single Professional Engineer (P.E.) registered in Rhode Island shall be the Engineer of Record for the project, therefore, where the Contractor modifies any portion of the signed construction documents; all components of the Work Plans shall be sealed and signed by a single registered P.E. in Rhode Island.

B. Acceptance Documentation: Submit the following to the Owner, Engineer and authorities having jurisdiction once system installation is complete, including field quality control and commissioning activities, and is otherwise "ready" for authority approval.
   1. Field Test Reports and Certificates: indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping". Make submittal after commissioning and prior to acceptance testing.
   2. Statement of Completion: Upon completion of the installation of the automatic sprinkler system, a signed written statement, substantially in the form as follows: Pre-Programming Documentation:

      "The undersigned, having been engaged as the Sprinkler Contractor for the Charles E. Shea High School automatic sprinkler system project in Pawtucket, Rhode Island, confirms that the automatic fire sprinkler system equipment was installed in accordance with the diagrams, instructions, directions, and technical specifications provided to us by the Manufacturer and the Building Owner."

C. Closeout Documentation: Prepare and submit a closeout documentation package to the Engineer for review prior to scheduling Owner demonstration and training. Resubmit portions or entirety of submittal to address Engineer comments prior to scheduling demonstration and training. The closeout submittal package shall include:
   1. Maintenance Data: The maintenance manual shall describe in detail the purpose and function of all sprinkler system devices and valves. The manual shall also include all necessary inspection, testing and maintenance forms. The Sprinkler Contractor shall provide the Owner with one (1) copy of NFPA 25, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, in addition to the maintenance manual.
   2. As-Built Drawings: Showing all field changes from original Working Plans. Submit full-size hard copy and electronic AutoCAD and PDF files. Coordinate AutoCAD version with Owner at time of submittal.
   3. As-Built Hydraulic Calculations: Showing all field changes from original Working Plans.

4. Valve Chart: Provide a drawing on 11-inch x 17-inch paper identifying the location of the control valves for the fire sprinkler system shown on the floor plan of the building. This valve chart shall be framed and permanently installed adjacent to the fire alarm control unit.
5. Statement of Warranty.

1.6 Coordination

A. Coordinate the installation of the fire sprinkler system and testing of associated equipment with all related trades, contractors, equipment maintenance and testing representatives, the Engineer, the Owner and the Authorities Having Jurisdiction.

B. The Fire Sprinkler Contractor shall furnish and install all sprinkler waterflow and valve supervisory switches. The Fire Alarm Contractor shall be responsible for all wiring connections to all sprinkler waterflow switches and valve supervisory switches. The Fire Sprinkler Contractor shall be responsible for adjusting the sprinkler waterflow switches and the valve supervisory switches to report a change in status.

C. Coordinate sprinkler location and installation with other portions of the Work to ensure sprinkler locations are at the highest possible elevations located to minimize the risk of mechanical damage.

D. Coordinate sprinkler installation with other portions of the Work to comply with NFPA 13 requirements for obstruction to sprinkler discharge.

E. Coordinate and receive approval from Owner and/or Engineer for the routing of sprinkler piping before installation. Coordinate and receive approval from Owner and/or Engineer for the routing of sprinkler piping before installation.

F. Coordinate sprinklers with unique ceiling features such as decorative metal panels, specialty ceilings, floating/cloud ceilings, light fixtures, etc.

1.7 Quality Assurance

A. Equipment and devices shall be labeled and approved for the intended use by UL.

B. Electrical components, devices, and accessories shall be listed, approved and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

C. All materials and equipment shall be new and unused.

D. All equipment shall be first quality and capable of complying with all requirements of this specification and shall have been in continuous production and in service in commercial applications for at least one year.

E. Obsolete equipment shall not be used.

F. Installer Qualifications: Licensed in the State of Rhode Island and experienced in the installation of automatic fire sprinkler systems in day care facilities similar to the Work described herein and has obtained design and inspection approvals for similar projects from authorities having jurisdiction.

G. Foreman: Provide proof of competence of both their company and the individual foreman that will be assigned to this project, in the area of installing automatic fire sprinkler systems for at least

five (5) years and acceptable to Owner. Once assigned, the foreman shall not be changed without the approval of the Owner.

H. Service Organization: Capable of providing a service technician on-site within 4 hours of a request for on-site service.

I. The automatic fire sprinkler systems shall comply with all applicable state and local codes, including:
1. The Rhode Island State Building Code – current edition
2. The Rhode Island Fire Safety Code – current edition, which includes:
a. The Rhode Island Fire Code (NFPA 1 – 2018 as amended)
b. The Rhode Island Life Safety Code (NFPA 101 – 2018 as amended)

J. Products, installation and testing shall be in accordance with the applicable provisions of the latest published edition of the following as referenced by the aforementioned codes and standards:
1. NFPA 13-2016, Standard for the Installation of Sprinkler Systems
2. NFPA 70-2020, National Electrical Code
3. NFPA 72-2019, National Fire Alarm and Signaling Code

1.8 Scheduling

A. The Contractor's Foreman shall act as primary point of contact and responsible-in-charge for coordinating the Pre-Acceptance Test with the other portions of the Work, Owner and the Engineer.

B. The Contractor's Foreman shall act as primary point of contact and responsible-in-charge for coordinating the Final-Acceptance Test with the other portions of the Work, Owner, Engineer and the AHJs.

C. Upon award, the Contractor shall provide a schedule to the Owner and Engineer for the milestones and construction progress.

1.9 Extra Materials

A. Furnish extra materials described below that match the products installed and that are packaged with protective covering for storage and identified with labels describing the contents.
1. Sprinkler Cabinet: Finished, wall-mounting steel cabinet and hinged cover, with space for a minimum of six (6) spare sprinklers for each type, model and temperature rating, plus a sprinkler wrench for each model.

1.10 Warranty

A. Guarantee equipment installed to be free from defects in workmanship and inherent mechanical defects for a period of one (1) year from the date of substantial completion of the project. See Part 1 "Submittals".

1.11 Qualification Of Bidders

A. All contractors connected with this project shall provide proof of competence of both their company and the individual foreman that will be assigned to this project. The Contractor shall have been in the business of installing automatic sprinkler systems for at least five (5) years, acceptable to Jensen Hughes and Owner. Once assigned, the Contractor's foreman shall not be changed without the approval of the Jensen Hughes and Owner.

B. Contractor shall be licensed in the State of Rhode Island and experienced in the installation of automatic sprinkler systems and has obtained design and inspection approvals for similar projects from authorities having jurisdiction.

C. The Contractor shall have on-staff a minimum NICET Level III certified technician who is experienced in providing automatic sprinkler system installation services.

D. Each proposed bid shall be professionally presented, be bound and shall include a title page and index.

E. As a minimum, all bidding contractors shall include the following in the sprinkler system bid:
   1. The names and qualifications of the Contractor's foreman, project manager and project engineer who shall be in responsible charge during the entire project installation. Contractor's qualifications shall include years in business, service policies, warranty definitions and prior experience with similar installations.
   2. A list of at least three (3) similar installations with addresses of properties, contact names and types of system equipment installed.
   3. Nonconformance to the Qualification of Bidders requirements outlined in this specification shall be cause for immediate dismissal of the Bid Documents without comment.
   4. The award of the contract shall be based on the submitted information and all considerations in the best interests of the Building Owner. Once the contract is awarded, no requested changes for equipment, suppliers or subcontractors shall be accepted unless justification is made in writing. Once assigned, the Contractor's foreman shall not be changed without the approval of Jensen Hughes and the Building Owner. Upon written request from the Contractor, Jensen Hughes and the Building Owner may authorize changes, but at their sole choice and discretion. The Contractor shall be at risk for any attempt to substitute the equipment suppliers or subcontractors accepted. All cost for removal, relocation, or replacement of a substituted item shall be at the risk of the Contractor.

2.0 PRODUCTS

2.1 Manufacturers

A. Subject to compliance with the requirements of this section, product selection shall be limited to those offered by manufacturers included in the "Available Manufacturer" lists in each Part 2 article. Substitution of the products listed requires approval by the Owner in writing prior to installation. The contractor shall submit a "Request for Alternative Manufacturer" form, completed in full, for approval by the owner and engineer. (Applicable form will be provided).

B. Where lists are not indicated, products, subject to compliance with the requirements of this section, may be obtained from an approved domestic manufacturer.

C. All products are to be approved and labeled for use by Underwriter's Laboratories (UL).

2.2 Pipe And Tube

A. Standard-Weight Steel Pipe: ASTM A53, or ASTM A135; Schedule 40 carbon steel, threaded or grooved ends for 1-inch up to 2-inch piping.

B. Light-Weight Steel Pipe: ASTM A53, or ASTM A135; Schedule 10 carbon steel, grooved ends for piping 2½-inch through 6-inch.

2.3 Pipe And Tube Fittings

A. Cast-Iron Threaded Fittings: ASME B16.4; Class 125 or Class 250 pattern as required by application.

B. Malleable-Iron Threaded Fittings: ASME B16.3; ASME B16.4; Class 125 or Class 250 pattern as required by application.

C. Steel Threaded Couplings: ASTM A865; ASME B16.4; Class 125 or Class 250 pattern as required by application.

D. Steel Welding Fittings: ASTM A234/A 234M, ASME B16.9, or ASME B16.11; 300-psi pressure rating.

E. Cast-Iron Threaded Flanges: ASME B16.1; ASME B16.4; Class 125 plain face or Class 250 raised face pattern as required by application.

F. Steel Flanges and Flanged Fittings: ASME B16.5; ASME B16.4; Class 125 plain-face or Class 250 raised face pattern as required by application.

G. Flange Gaskets and Bolts
   1. Plain-face Flanges: ASME B18.2.2 heavy-series hex-nuts and ASME B18.22.1 plain washers with ASME B16.21 1/8" full-face rubber gasket.
   2. Raised-face Flanges: ASME B18.2.2 heavy-series hex-nuts and ASME B18.22.1 plain washers with ASME B16.20 1/8" spiral wound gasket.

H. Mechanical Grooved-End Fittings:
   1. Assembly Pressure Rating: 300-psi.
   2. Fittings and Couplings: UL 213; ASTM A536 ductile iron body.
   3. Couplings: UL 213; ASTM A536 ductile iron rigid or flexible pattern as required by application.
   4. Gaskets and Bolts: Pre-lubricated EPDM gaskets with ASTM A183 zinc-plated nuts and bolts.
   5. Available Manufacturers
      a. Central Sprinkler Co.
      b. Victaulic Fire Protection, Inc.

I. Mechanical Tees: Mechanical tees are not permitted to be used.

2.4 Valves

A. General: Minimum 175-psig (1200-kPa) non-shock working-pressure rating unless higher pressure rating is required by application or otherwise indicated. Valves for grooved-end pipe may be furnished with grooved ends instead of flanged ends.

B. Gate Valves; NPS 2-inch (DN50) and Smaller: UL 262; cast-bronze, threaded ends; solid wedge; OS&Y; and pre-grooved rising stem. NPS 2-1/2-inch (DN65) and Larger: UL 262, iron body, bronze mounted, tapered wedge, OS&Y, and pre-grooved rising stem. Include replaceable, bronze, wedge facing rings and flanged ends.
   1. Available Manufacturers
      a. Kennedy Valve Div.; McWane, Inc.
      b. Mueller Co.
      c. Nibco Inc.

d. Stockham Valves & Fittings

C. Swing Check Valves; NPS 2-inch (DN50) and Smaller: UL 312; cast-bronze, threaded ends. NPS 2-1/2-inch (DN65) and Larger: UL 312, cast-iron body and bolted cap, with bronze disc or cast-iron disc with bronze-disc ring and flanged ends.
1. Available Manufacturers
a. Grinnell Corp.
b. Kennedy Valve Div.; McWane, Inc.
c. Mueller Co.
d. Nibco Inc.
e. Stockham Valves & Fittings
f. Viking Corp.

D. "Riser" Swing Check Valves: UL 312, cast iron body designed for horizontal or vertical installation, with grooved ends, bronze grooved seat with O-ring seals, and single-hinge pin and latch design. Include pressure gauges and 2-inch drain valve and trim.
1. Available Manufacturers
a. Central Sprinkler Co.
b. Reliable Sprinkler Co.
c. Victaulic Co.
d. Viking Corp.

E. Indicating Valves; NPS 2-inch (DN65) and Smaller: UL 1091; butterfly or ball-type, bronze body with threaded ends; and integral indicating device and pre-wired supervisory switch. NPS 2-1/2-inch (DN65) and Larger: UL 1091; butterfly-type, ductile-iron body with grooved ends; and integral indicating device and pre-wired supervisory switch.
1. Available Manufacturers
a. Central Sprinkler Co.
b. Grinnell Corp.
c. Kennedy Valve Div.; McWane, Inc.
d. Mueller Co.
e. Victaulic Co.

F. Ball Drip Valves: UL 1726, automatic drain valve, NPS 3/4 (DN20), ball check device with threaded ends. Automatic ball drip valve shall be installed on the pipe to the fire department connection to prevent water being trapped in the pipe which may become subject to freezing.
1. Available Manufacturers
a. Grinnell Corp.
b. Reliable Sprinkler Co

2.5 Sprinklers

A. General: UL 199 nominal 1/2-inch [K5.6] orifice standard-spray pattern sprinklers with "Ordinary" temperature classification rating, unless otherwise indicated or required by application.

B. Pressure Rating: 175-psi minimum unless otherwise indicated or required by application.

C. Operating Element: Quick Response (QR) as indicated or required by application. Refer to drawings for specific sprinkler types.

D. Sprinkler Types and Features include the following:
1. Upright and pendents in areas where sprinkler is exposed (i.e. below hard ceilings or exposed deck).

2. Recessed pendents in acoustic ceiling tiles and hard ceilings as shown on the drawings.

E. Sprinkler Finishes shall be coordinated with Architect and Owner, but shall include the following:
1. Rough-brass (bronze).
2. Chrome-plated.
3. White baked enamel.

F. Sprinkler Guards: Wire-cage type with zinc chromate finish, including fastening device for attaching to sprinkler. Sprinkler Guards shall be used on upright, sidewall and non-recessed pendent sprinklers in the multi-purpose room, gymnasiums, mechanical spaces, crawl spaces and attic spaces. Sprinkler guards shall be listed for the sprinkler to which it is attached.
1. Sprinkler guards shall be installed on all sprinklers where they are susceptible to mechanical damage as indicated on the drawings. This includes sprinklers located below obstructions, in the gymnasium, and as indicated elsewhere on the drawings.

G. Available Manufacturers
1. Tyco.
2. Reliable Automatic Sprinkler Company.
3. Viking Corporation.
4. Victaulic Company.

H. Sprinkler Temperatures:
1. Sprinklers shall have a nominal temperature rating of 165 degrees F, unless as noted below.
2. Sprinklers in mechanical rooms and boiler rooms shall have Intermediate (175 to 225 degrees F) temperature rating at a minimum.
3. Sprinklers shall have Intermediate (175 to 225 degrees F) or High (250 to 300 degrees F) temperature rating as necessary, where located adjacent to HVAC diffusers discharging air greater than 100 degrees F per NFPA 13.

2.6 Fire Alarm Monitoring Devices

A. General: NEMA enclosure suitable for intended application; include tamper resistant cover with switch that transmits signal upon removal of cover; 250-psi (1752-kPa) pressure rating; two sets, single-pole double-throw form C contacts.

B. Water-Flow Indicators: UL 346 vane-type with field adjustable 0-90 second retard feature.

C. Valve Supervisory Switches: UL 753 with normally closed contacts and compatible with valve stem to be monitored.

D. Available Manufacturers
1. Grinnell Corp.
2. Potter Electric Signal Co.
3. System Sensor Div.; Honeywell, Inc.

2.7 Pressure Gauges

A. Water Pressure Gauges: UL 393, 3-1/2- to 4-1/2-inch- (90- to 115-mm-) diameter dial with dial range of 0 to 250 psig (0 to 1725 kPa).

B. Available Manufacturers
1. Brecco Corp.
2. Dresser Instruments.

3. US Gauge.

2.8 Automatic Air Vents

A. Provide automatic air vents that do not require piping to a drain.

B. Available Manufacturer.
1. ECS – Ejector PAV-W Automatic Air Vent

2.9 Pipe Sleeves

A. General: Provide pipe sleeves where piping passes entirely through walls, floors and partitions. Secure sleeves in position during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors and roofs. Provide 1-inch minimum clearance between exterior of piping and interior of sleeve or core-drilled hole. Firmly pack space with mineral wool insulation. Seal space at both ends of the sleeve or core-drilled hole with plastic waterproof cement, which will dry to a firm but pliable mass, or provide a mechanically adjustable segmented elastomeric material. Penetrations of fire-rated barriers, wall and floor assemblies shall be sealed with a listed through penetration firestopping assembly.
1. Sleeves in Masonry and Concrete Walls, Floors, and Roofs: Provide hot-dip galvanized steel, ductile-iron, or cast-iron sleeves. Core-drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled hole are completely grouted smooth.
2. Sleeves in Other Than Masonry and Concrete Walls, Floors, and Roofs: Provide 26 gauge galvanized steel sheet.

3.0 EXECUTION

3.1 Examination

A. Coordinate examinations with the Owner.

B. Examine and verify actual location of risers, mains and branch line piping prior to preparing preinstallation submittal.

C. Examine walls and partitions for suitable thickness, fire- and smoke-rated construction, framing and other conditions where pipes, risers and cross-mains are to be installed prior to preparing pre-installation submittal.

D. The contractor shall be responsible for the examination, testing, and abatement for asbestos and lead throughout the building.

3.2 Preparation

A. Prepare and submit a minimum of three (3) complete “Pre-Installation Documentation” submittal packages to the Engineer for review prior to submitting same to local officials (as required) for approval and permit. Resubmit portions or entirety of submittal to address Engineer comments prior to submitting package to local officials (as required) for approval and permit. See Part 1 “Submittals” for submittal content.

B. Obtain Owner approval to deliver materials and begin installation once “Pre-Installation Documentation” review process is complete and necessary local approvals and permits have been secured.

3.3 Piping Application

A. Use threaded or grooved-end fittings to make changes in direction, branch takeoffs from mains and reduction in pipe sizes. Mechanical fittings are not permitted for branchline connections or sprinkler connections.

3.4 Piping Installation

A. Refer to manufacturer's specifications and NFPA 13 for basic piping installation.

B. Install exposed piping in normally occupied areas as tight to ceiling as possible. Rise with elbows in series as necessary to adjust final height of piping. Cut hanger rods to length that allows nuts to be tightened flush with ceiling and leaves band hangers at the highest elevation possible.

C. Use threaded or grooved-end fittings to make changes in direction, branch takeoffs from mains and reduction in pipe sizes. Mechanical fittings are not permitted for branchline connections or sprinkler connections.

D. Install unions adjacent to each valve in pipes NPS 2-inch (DN50) and smaller. Unions are not required on flanged devices or in piping installations using grooved joints.

E. Install flanges or flange adapters on valves, apparatus, and equipment having NPS 2-1/2-inch (DN65) and larger connections as required for proper connection.

F. Install sprinkler piping with drains for complete system drainage. All drain piping shall be routed to a location approved by the Owner and Jensen Hughes.

G. Install alarm devices in piping systems as shown on the drawings.

H. Install inspector's test connections. The outlet shall discharge to the exterior of the building.

I. Hangers and Supports: Install according to NFPA 13 for sprinkler piping.

J. Install piping with grooved joints according to manufacturer's written instructions. Construct rigid piping joints through masonry penetrations. Provide flexible couplings within 1-foot of each side of the floor/ceiling assembly on vertical sprinkler supply risers.

K. Install pressure gauges on riser or feed main, at each sprinkler floor control valve assembly, on both sides of every check valve and at the top of each standpipe riser. Include pressure gauges with connection not less than NPS 1/4 (DN8) and with soft metal seated 3-way valve, plugged at one end and arranged for draining pipe between gauge and valve. Install gauges to permit removal and install where they will not be subject to freezing.

L. Flanges, unions, and transition and special fittings with pressure ratings the same as or higher than the systems pressure rating may be used in aboveground applications, unless otherwise indicated.

M. All branch lines shall be pitched at least 1/2-in. per ten (10) feet. All mains shall be pitched at least 1/4-inch per ten (10) feet.

3.5 Joint Construction

A. Refer to manufacturer's specifications for basic piping joint construction.

B. Steel-Piping, Grooved Joints: Use Schedule 40 steel pipe with grooved ends; steel, grooved-end fittings; and groove couplings. Assemble joints with couplings, gaskets, lubricant, and bolts according to manufacturer's written instructions.

C. Dissimilar-Piping-Material Joints: Construct joints using adapters or couplings compatible with both piping materials. Use dielectric fittings if both piping materials are metal.

D. Refer to Manufacturer's specifications for grooved pipe fittings, pipe-flange gasket materials and welding filler metals.

E. Joint compound or tape shall be applied to male pipe threads only for all threaded joints.

F. Transition Couplings: AWWA C219, sleeve type, or other manufactured fitting the same size as, with pressure rating at least equal to, and with ends compatible with piping to be joined.

3.6 Valve Applications

A. Drawings indicate valve types to be used.

3.7 Valve Installation

A. Install valves in accessible locations with indicators clearly visible from floor level. Where valves are located above ceilings or accessible through access panels, provide and install signs identify locations.

B. Maintain floor control assemblies at 8'-6" above the finished floor. Where this installation height is not feasible, the particular location is to be reviewed by Jensen Hughes and the Building Owner prior to installation.

3.8 Sprinkler Applications

A. Drawings indicate sprinkler types to be used.
   1. Contractor may substitute vertical sidewall sprinklers for horizontal sidewall sprinklers where unable to install the horizontal sidewall sprinklers a minimum of 4" off the wall or a maximum of 6" off the wall. The installation of the vertical sidewall sprinklers shall be in accordance with NFPA 13. See Part 3 "Wiring Installation" for identification of conductors.

B. Use Quick-Response (QR) sprinklers in Light Hazard areas, unless otherwise noted.

C. Use Quick-Response (QR) sprinklers in Ordinary Hazard areas, unless otherwise noted.

3.9 Sprinkler Installation

A. Install sprinklers in accordance with NFPA 13 and in the locations indicated on the approved working drawings.

B. Install upright sprinklers in normally occupied areas where ceiling is exposed to structure at the highest elevation possible while observing the NFPA 13 requirements for obstructions to sprinkler discharge. Do not lower the elevation of sprinklers to locate deflector below solid-continuous obstructions in lieu of providing adequate horizontal clearance in accordance with NFPA 13.

C. Install sprinklers in the center of suspended ceiling tiles, where applicable.

D. Do not install wet-type pendent or sidewall sprinklers in areas subject to freezing. Use upright or dry-type sprinklers with water supply from heated space.

E. Use sprinkler guards on all sprinklers located under obstructions, in the Gymnasium and other locations as noted on the drawings.

F. Do not install sprinklers, mains or branchline pipes in locations where likely to be inadvertently damaged, such as in front of access hatches, doors, cabinets, etc.

3.10 Fire Alarm Monitoring Device Installation

A. Install waterflow, pressure and valve supervisory switches to be connected to the Fire Alarm system.

B. Adjust retard feature of waterflow indicating switches to approximately 30-45 seconds for each zone with a 60-70 second setting for the main waterflow switch.

C. Coordinate installation, wiring connections, and testing with the Fire Alarm System Contractor.

3.11 Exterior Wall Penetrations

A. Include escutcheons and watertight annular-space “soft” seal of appropriate size for the intended hole and pipe diameters, as recommended by the seal manufacturer. Seal material shall be of an approved type.

3.12 Labeling And Identification

A. Install labeling, signs and pipe markers on valves, equipment and piping in accordance with NFPA 13.

B. Signs and label styles and locations shall be coordinated with and approved by the Owner and the authorities having jurisdiction prior to installation.

C. Install hydraulic design information sign on the “main system riser”.

3.13 Field Quality Control

A. Perform hydrostatic test of entire sprinkler system and inspect sprinkler piping according to NFPA 13, "System Acceptance" Chapter. Coordinate hydrostatic test date and time of test with the Owner, Engineer and the authorities having jurisdiction.

B. Replace piping system components that do not pass test procedures and retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.

C. Report test results promptly and in writing to the Owner, Engineer and the authorities having jurisdiction. See Part 1 “Submittals”.

3.14 Cleaning And Protection

A. Clean dirt and debris from sprinklers.

B. Remove and replace sprinklers having paint other than factory applied finish.

C. Wipe all excess pipe joint compound from threaded pipe joints.

D. Wipe all excess oil from the exterior surface of sprinkler mains and branchline pipes.

E. Protect sprinklers from damage until substantial completion by other trades that may be working in building.

3.15 Commissioning

A. Verify that specialty valves, trim, fittings, controls, and accessories are installed and operate correctly.

B. Verify that specified tests of piping are complete.

C. Verify that damaged sprinklers and sprinklers with paint or coating not specified are replaced with new, correct type.

D. Verify that sprinklers are correct types, have correct finishes and temperature ratings, and have guards as required for each application.

E. Verify that potable-water supplies have correct types of backflow prevention devices and have been tested.

F. Verify that spare sprinkler cabinet is installed with correct number of wrenches and spare sprinklers.

G. Verify that labeling, identification and signage is installed.

H. Fill wet-pipe sprinkler piping with water.

I. Energize circuits to electrical equipment and devices.

J. Coordinate with fire alarm contractor to perform acceptance test with new valve monitoring devices and sprinkler system alarm devices. Operate as required.

K. Report completion of commissioning promptly and in writing to the Owner, Engineer and the authorities having jurisdiction. See Part 1 “Submittals”.

3.16 Acceptance Tests

A. Coordinate with fire alarm contactor for acceptance tests. Operate as required. Demonstrate system components to authority having jurisdiction as necessary.

3.17 Project Closeout Procedures

A. Submit Project Closeout Documentation; see Part 1 “Submittals”.

B. Schedule Owner demonstration and training with the Owner. Provide at least five (5) working days’ notice.

C. Demonstrate equipment, specialties, and accessories with the Owner. Review operating and maintenance information with the Owner.

END OF SPECIFICATION

DATE: DECEMBER 4, 2024

HYDRAULIC CALCULATIONS FOR:
CHARLES E. SHEA HIGH SCHOOL
485 EAST AVENUE
PAWTUCKET, RI 02860

DRAWING NUMBER: FP-1.1

REMOTE AREA NUMBER: 1
REMOTE AREA LOCATION: 1ST FLOOR CLASSROOM

DESIGN DATA:
OCCUPANCY CLASSIFICATION: ORDINARY HAZARD GROUP 1
DENSITY: 0.15 GPM/SQ. FT.
AREA OF APPLICATION: 1013 SQ. FT.

COVERAGE PER SPRINKLER: 130 SQ. FT. MAXIMUM
TYPE OF SPRINKLERS CALCULATED: 5.6K QUICK-RESPONSE
NUMBER OF SPRINKLERS CALCULATED: 11

HOSE-STREAM DEMAND: 250 GPM
TOTAL WATER REQUIRED (INCLUDING HOSE): 488.7 GPM
FLOW AND PRESSURE (AT BASE OF RISER): 238.7 GPM @ 58.7 PSI

TYPE OF SYSTEM: WET

WATER SUPPLY:
TEST DATE: OCTOBER 9, 2024
TEST GAUGE LOCATION: EXISTING RISER
STATIC PRESSURE: 71 PSI
RESIDUAL PRESSURE: 66 PSI
FLOW LOCATION: HYDRANT D05-024
FLOW: 1343 GPM

NAME OF DESIGNER: EBJ
AUTHORITY HAVING JURISDICTION: PAWTUCKET FIRE DEPARTMENT

Calculations performed by HASS under license # 65847320 ,
granted by HRS SYSTEMS, INC.
(Notes continue after pipe calculations results.)

12-04-24

DATE: 12/2/2024AULIC CALCULATIONS\BID DOCS\REMOTE AREA #1 - 1ST FLOOR.SDF
JOB TITLE: Remote Area #1 - 1st Floor

WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	@ FLOW (GPM)	AVAIL. PRESS. (PSI)	@ TOTAL DEMAND (GPM)	REQ'D PRESS. (PSI)
SOURCE	71.0	66.0	1343.0	70.2	488.7	58.7

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	488.7 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	250.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	238.7 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
BFPI	3.0	- - - -	58.7	- - -
BFPO	3.0	- - - -	53.7	- - -
BOR	3.0	- - - -	53.7	- - -
TOR	7.0	- - - -	51.8	- - -
0A	9.3	- - - -	50.5	- - -
1A	19.7	- - - -	44.8	- - -
1B	21.2	- - - -	38.0	- - -
1C	21.2	- - - -	37.9	- - -
1B1	22.2	- - - -	22.6	- - -
1B2	22.2	- - - -	21.6	- - -
1B3	22.2	- - - -	18.1	- - -
1C1	22.2	- - - -	16.6	- - -
1C2	22.2	- - - -	15.1	- - -
1S1	21.5	K= 5.60	17.4	23.3
1S1.1	22.2	- - - -	19.0	- - -
1S2	19.2	K= 5.60	16.3	22.6
1S3	21.5	K= 5.60	16.4	22.7
1S3.1	22.2	- - - -	18.0	- - -
1S4	21.5	K= 5.60	18.1	23.8
1S4.1	22.2	- - - -	19.8	- - -
1S5	21.5	K= 5.60	17.7	23.6
1S5.1	22.2	- - - -	19.4	- - -
1S6	21.5	K= 5.60	14.9	21.6
1S6.1	22.2	- - - -	16.3	- - -
1S7	21.5	K= 5.60	13.6	20.7
1S7.1	22.2	- - - -	14.9	- - -
1S8	21.5	K= 5.60	13.3	20.4
1S8.1	22.2	- - - -	14.5	- - -
1S9	21.5	K= 5.60	13.6	20.6
1S9.1	22.2	- - - -	14.8	- - -
1S10	21.5	K= 5.60	12.4	19.7
1S10.1	22.2	- - - -	13.5	- - -
1S11	21.5	K= 5.60	12.1	19.5
1S11.1	22.2	- - - -	13.2	- - -
SOURCE	3.0	SOURCE	58.7	238.7

DATE: 12/2/2024AULIC CALCULATIONS\BID DOCS\REMOTE AREA #1 - 1ST FLOOR.SDF
JOB TITLE: Remote Area #1 - 1st Floor

PIPE DATA

PIPE TAG / END NODES	ELEV. (FT)	NOZ. (K)	PT (PSI)	DISC. (GPM)	Q(GPM) VEL(FPS)	DIA(IN) HW(C) FL/FT	LENGTH (FT)		PRESS. SUM. (PSI)
Pipe: 1					238.7	6.357 PL	1.00	PF	0.0
SOURCE	3.0	SRCE	58.7	(N/A)	2.4	120 FTG	----	PE	0.0
BFPI	3.0	0.0	58.7	0.0		0.002 TL	1.00	PV	
Pipe: 2					FIXED PRESSURE LOSS DEVICE				
BFPI	3.0	0.0	58.7	0.0	5.0 psi, 238.7 gpm				
BFPO	3.0	0.0	53.7	0.0					
Pipe: 3					238.7	6.357 PL	2.00	PF	0.0
BFPO	3.0	0.0	53.7	0.0	2.4	120 FTG	----	PE	0.0
BOR	3.0	0.0	53.7	0.0		0.002 TL	2.00	PV	
Pipe: 4					238.7	6.357 PL	4.00	PF	0.2
BOR	3.0	0.0	53.7	0.0	2.4	120 FTG	TCB	PE	-1.7
TOR	7.0	0.0	51.8	0.0		0.002 TL	95.00	PV	
Pipe: 5					238.7	6.357 PL	40.00	PF	0.3
TOR	7.0	0.0	51.8	0.0	2.4	120 FTG	5E	PE	-1.0
0A	9.3	0.0	50.5	0.0		0.002 TL	130.00	PV	
Pipe: 7					238.7	4.260 PL	20.33	PF	1.2
0A	9.3	0.0	50.5	0.0	5.4	120 FTG	2ETB	PE	-4.5
1A	19.7	0.0	44.8	0.0		0.014 TL	88.33	PV	
Pipe: 8					238.7	4.260 PL	260.00	PF	6.2
1A	19.7	0.0	44.8	0.0	5.4	120 FTG	5E3TCB	PE	-0.6
1B	21.2	0.0	38.0	0.0		0.014 TL	448.00	PV	
Pipe: 9					122.6	4.260 PL	28.25	PF	0.1
1B	21.2	0.0	38.0	0.0	2.8	120 FTG	----	PE	0.0
1C	21.2	0.0	37.9	0.0		0.004 TL	28.25	PV	
Pipe: 10					116.1	1.610 PL	19.75	PF	14.9
1B	21.2	0.0	38.0	0.0	18.3	120 FTG	2ET	PE	-0.4
1B1	22.2	0.0	22.6	0.0		0.418 TL	35.75	PV	
Pipe: 11					47.4	1.610 PL	12.00	PF	1.0
1B1	22.2	0.0	22.6	0.0	7.5	120 FTG	----	PE	0.0
1B2	22.2	0.0	21.6	0.0		0.080 TL	12.00	PV	
Pipe: 12					68.6	1.380 PL	4.75	PF	3.6
1B1	22.2	0.0	22.6	0.0	14.7	120 FTG	T	PE	0.0
1S1.1	22.2	0.0	19.0	0.0		0.335 TL	10.75	PV	
Pipe: 13					45.3	1.380 PL	5.50	PF	0.9
1S1.1	22.2	0.0	19.0	0.0	9.7	120 FTG	----	PE	0.0
1B3	22.2	0.0	18.1	0.0		0.155 TL	5.50	PV	
Pipe: 14					22.6	1.049 PL	10.50	PF	3.2
1B3	22.2	0.0	18.1	0.0	8.4	120 FTG	2ET	PE	1.3
1S2	19.2	5.6	16.3	22.6		0.163 TL	19.50	PV	

PIPE TAG / END NODES	ELEV. (FT)	NOZ. (K)	PT (PSI)	DISC. (GPM)	Q(GPM) VEL(FPS)	DIA(IN) HW(C) FL/FT	LENGTH (FT)		PRESS. SUM. (PSI)
Pipe: 15					22.7	1.380 PL	4.50	PF	0.2
1B3	22.2	0.0	18.1	0.0	4.9	120 FTG	----	PE	0.0
1S3.1	22.2	0.0	18.0	0.0		0.043 TL	4.50	PV	
Pipe: 16					47.4	1.380 PL	4.75	PF	1.8
1B2	22.2	0.0	21.6	0.0	10.2	120 FTG	T	PE	0.0
1S4.1	22.2	0.0	19.8	0.0		0.169 TL	10.75	PV	
Pipe: 17					23.6	1.380 PL	10.00	PF	0.5
1S4.1	22.2	0.0	19.8	0.0	5.1	120 FTG	----	PE	0.0
1S5.1	22.2	0.0	19.4	0.0		0.046 TL	10.00	PV	
Pipe: 18					122.6	1.610 PL	21.00	PF	20.8
1C	21.2	0.0	37.9	0.0	19.3	120 FTG	4ET	PE	-0.4
1C1	22.2	0.0	16.6	0.0		0.463 TL	45.00	PV	
Pipe: 19					59.9	1.610 PL	12.00	PF	1.5
1C1	22.2	0.0	16.6	0.0	9.4	120 FTG	----	PE	0.0
1C2	22.2	0.0	15.1	0.0		0.123 TL	12.00	PV	
Pipe: 20					21.6	1.380 PL	2.50	PF	0.3
1C1	22.2	0.0	16.6	0.0	4.6	120 FTG	T	PE	0.0
1S6.1	22.2	0.0	16.3	0.0		0.040 TL	8.50	PV	
Pipe: 21					41.1	1.380 PL	7.50	PF	1.8
1C1	22.2	0.0	16.6	0.0	8.8	120 FTG	T	PE	0.0
1S7.1	22.2	0.0	14.9	0.0		0.130 TL	13.50	PV	
Pipe: 22					20.4	1.380 PL	10.00	PF	0.4
1S7.1	22.2	0.0	14.9	0.0	4.4	120 FTG	----	PE	0.0
1S8.1	22.2	0.0	14.5	0.0		0.036 TL	10.00	PV	
Pipe: 23					20.6	1.380 PL	2.50	PF	0.3
1C2	22.2	0.0	15.1	0.0	4.4	120 FTG	T	PE	0.0
1S9.1	22.2	0.0	14.8	0.0		0.036 TL	8.50	PV	
Pipe: 24					39.2	1.380 PL	7.50	PF	1.6
1C2	22.2	0.0	15.1	0.0	8.4	120 FTG	T	PE	0.0
1S10.1	22.2	0.0	13.5	0.0		0.119 TL	13.50	PV	
Pipe: 25					19.5	1.380 PL	10.00	PF	0.3
1S10.1	22.2	0.0	13.5	0.0	4.2	120 FTG	----	PE	0.0
1S11.1	22.2	0.0	13.2	0.0		0.033 TL	10.00	PV	
Pipe: 26					23.3	1.049 PL	2.00	PF	1.9
1S1.1	22.2	0.0	19.0	0.0	8.7	120 FTG	2ET	PE	0.3
1S1	21.5	5.6	17.4	23.3		0.173 TL	11.00	PV	
Pipe: 27					22.7	1.049 PL	2.00	PF	1.8
1S3.1	22.2	0.0	18.0	0.0	8.4	120 FTG	2ET	PE	0.3
1S3	21.5	5.6	16.4	22.7		0.164 TL	11.00	PV	

PIPE TAG / END NODES	ELEV. (FT)	NOZ. (K)	PT (PSI)	DISC. (GPM)	Q(GPM) VEL(FPS)	DIA(IN) HW(C) FL/FT	LENGTH (FT)		PRESS. SUM. (PSI)
Pipe: 28					23.8	1.049 PL	2.00	PF	2.0
1S4.1	22.2	0.0	19.8	0.0	8.9	120 FTG	2ET	PE	0.3
1S4	21.5	5.6	18.1	23.8		0.180 TL	11.00	PV	
Pipe: 29					23.6	1.049 PL	2.00	PF	1.9
1S5.1	22.2	0.0	19.4	0.0	8.7	120 FTG	2ET	PE	0.3
1S5	21.5	5.6	17.7	23.6		0.176 TL	11.00	PV	
Pipe: 30					21.6	1.049 PL	2.00	PF	1.7
1S6.1	22.2	0.0	16.3	0.0	8.0	120 FTG	2ET	PE	0.3
1S6	21.5	5.6	14.9	21.6		0.150 TL	11.00	PV	
Pipe: 31					20.7	1.049 PL	2.00	PF	1.5
1S7.1	22.2	0.0	14.9	0.0	7.7	120 FTG	2ET	PE	0.3
1S7	21.5	5.6	13.6	20.7		0.138 TL	11.00	PV	
Pipe: 32					20.4	1.049 PL	2.00	PF	1.5
1S8.1	22.2	0.0	14.5	0.0	7.6	120 FTG	2ET	PE	0.3
1S8	21.5	5.6	13.3	20.4		0.135 TL	11.00	PV	
Pipe: 33					20.6	1.049 PL	2.00	PF	1.5
1S9.1	22.2	0.0	14.8	0.0	7.7	120 FTG	2ET	PE	0.3
1S9	21.5	5.6	13.6	20.6		0.138 TL	11.00	PV	
Pipe: 34					19.7	1.049 PL	2.00	PF	1.4
1S10.1	22.2	0.0	13.5	0.0	7.3	120 FTG	2ET	PE	0.3
1S10	21.5	5.6	12.4	19.7		0.127 TL	11.00	PV	
Pipe: 35					19.5	1.049 PL	2.00	PF	1.4
1S11.1	22.2	0.0	13.2	0.0	7.2	120 FTG	2ET	PE	0.3
1S11	21.5	5.6	12.1	19.5		0.124 TL	11.00	PV	

NOTES (HASS):

(1) Calculations were performed by the HASS 2023 D computer program in accordance with NFPA (2020) under license no. 65847320 granted by
HRS Systems, Inc.
208 Southside Square
Petersburg, TN 37144
(931) 659-9760

(2) The system has been calculated to provide an average imbalance at each node of 0.002 gpm and a maximum imbalance at any node of 0.063 gpm.

(3) Total pressure at each node is used in balancing the system. Maximum water velocity is 19.3 ft/sec at pipe 18.

(4) Items listed in bold print on the cover sheet

are automatically transferred from the calculation report.

(5) Fullflow calculations are not done for systems with variable speed pumps.

(6) PIPE FITTINGS TABLE

HASS Pipe Table Name: standard

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NTee
	F F45Ell								
1.049	2.00 1.00	5.00	2.00	5.00	6.00	1.00	10.00	2.00	5.00
1.380	3.00 1.50	6.00	2.00	7.00	6.00	1.00	10.00	10.00	6.00
1.610	4.00 2.00	8.00	2.00	9.00	6.00	1.00	10.00	10.00	8.00

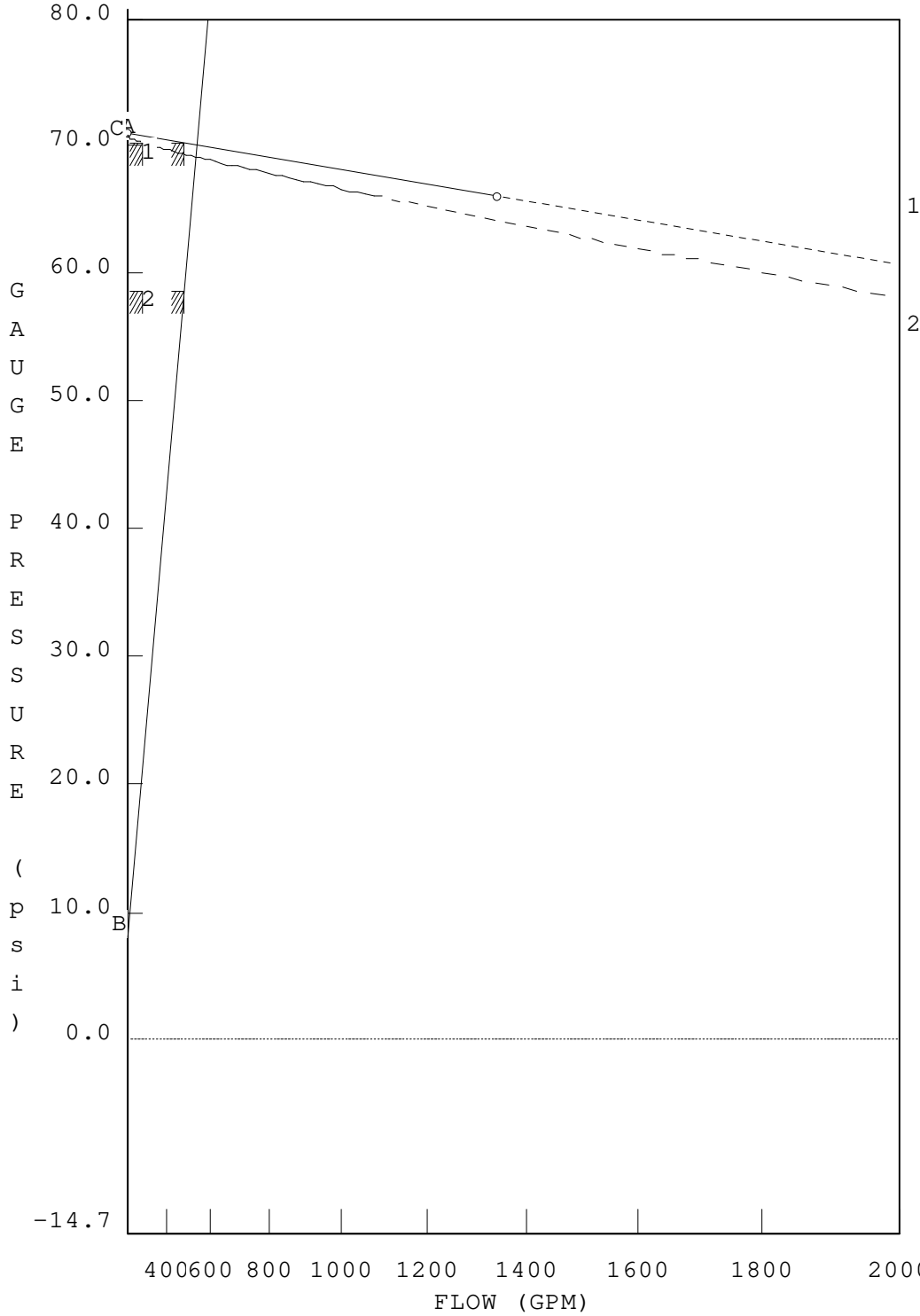
PAGE: B MATERIAL: THNWL HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	NP NPTee
	F F45Ell								
4.260	13.00 6.50	26.00	8.00	29.00	16.00	3.00	26.00	26.00	26.00
6.357	18.00 9.00	38.00	11.00	40.00	13.00	4.00	35.00	35.00	38.00

DATE: 12/2/2024AULIC CALCULATIONS\BID DOCS\REMOTE AREA #1 - 1ST FLOOR.SDF
JOB TITLE: Remote Area #1 - 1st Floor

WATER SUPPLY ANALYSIS

Static: 71.00 psi Resid: 66.00 psi Flow: 1343.0 gpm



LEGEND

1 Available pressure
70.23 psi @ 488.7 gpm

2 Required pressure
58.73 psi @ 488.7 gpm

Avail. OnSite Demand Press.
70.23 psi @ 238.7 gpm

Req. OnSite Demand Press.
58.73 psi @ 238.7 gpm

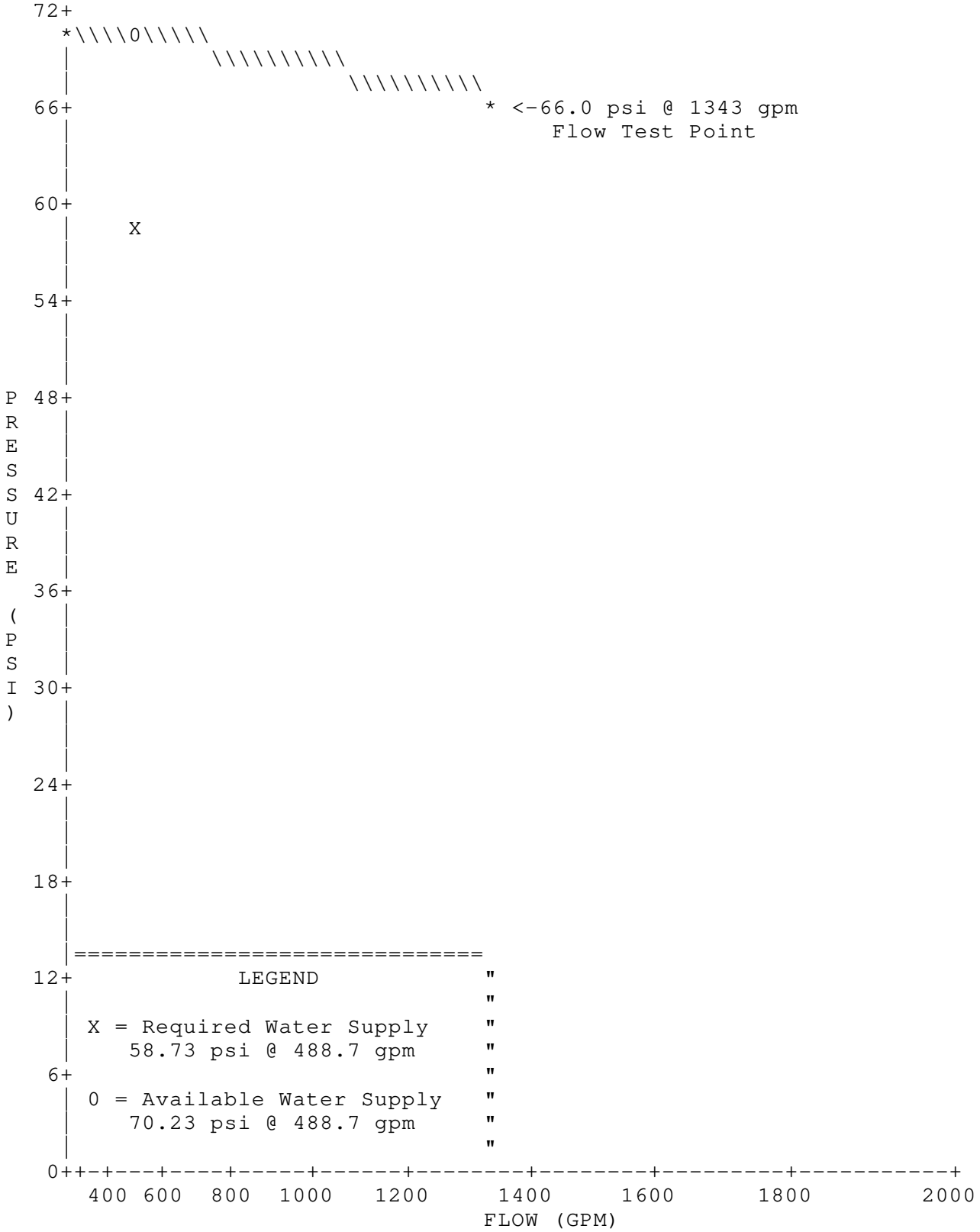
A. Source Supply Curve
B. System Demand Curve
C. Available at Source

Note: (1) Dashed Lines indicate extrapolated values from Test Results

(2) On Site pressures are based on hose stream deduction at the source

DATE: 12/2/2024AULIC CALCULATIONS\BID DOCS\REMOTE AREA #1 - 1ST FLOOR.SDF
JOB TITLE: Remote Area #1 - 1st Floor

WATER SUPPLY CURVE



DATE: DECEMBER 4, 2024

HYDRAULIC CALCULATIONS FOR:
CHARLES E. SHEA HIGH SCHOOL
485 EAST AVENUE
PAWTUCKET, RI 02860

DRAWING NUMBER: FP-3.1

REMOTE AREA NUMBER: 2
REMOTE AREA LOCATION: 3RD FLOOR CLASSROOM

DESIGN DATA:
OCCUPANCY CLASSIFICATION: LIGHT HAZARD
DENSITY: 0.10 GPM/SQ. FT.
AREA OF APPLICATION: 1183 SQ. FT.

COVERAGE PER SPRINKLER: 225 SQ. FT. MAXIMUM
TYPE OF SPRINKLERS CALCULATED: 5.6K QUICK-RESPONSE
NUMBER OF SPRINKLERS CALCULATED: 11

HOSE-STREAM DEMAND: 100 GPM
TOTAL WATER REQUIRED (INCLUDING HOSE): 308.2 GPM
FLOW AND PRESSURE (AT BASE OF RISER): 208.2 GPM @ 50.3 PSI

TYPE OF SYSTEM: WET

WATER SUPPLY:
TEST DATE: OCTOBER 9, 2024
TEST GAUGE LOCATION: EXISTING RISER
STATIC PRESSURE: 71 PSI
RESIDUAL PRESSURE: 66 PSI
FLOW LOCATION: HYDRANT D05-024
FLOW: 1343 GPM

NAME OF DESIGNER: EBJ
AUTHORITY HAVING JURISDICTION: PAWTUCKET FIRE DEPARTMENT

Calculations performed by HASS under license # 65847320 ,
granted by HRS SYSTEMS, INC.
(Notes continue after pipe calculations results.)

12-04-24

DATE: 12/2/2024AULIC CALCULATIONS\BID DOCS\REMOTE AREA #2 - 3RD FLOOR.SDF
JOB TITLE: Remote Area #2 - 3rd Floor

WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. @ (PSI)	FLOW @ (GPM)	AVAIL. PRESS. @ (PSI)	TOTAL DEMAND (GPM)	REQ'D PRESS. (PSI)
SOURCE	71.0	66.0	1343.0	70.7	308.2	50.3

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	308.2 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	100.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	208.2 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
BFPI	3.0	- - - -	50.3	- - -
BFPO	3.0	- - - -	45.3	- - -
BOR	3.0	- - - -	45.3	- - -
TOR	7.0	- - - -	43.4	- - -
0A	9.3	- - - -	42.2	- - -
3A	45.0	- - - -	25.6	- - -
3B	46.5	- - - -	19.8	- - -
3C	46.5	- - - -	19.8	- - -
3D	46.5	- - - -	19.8	- - -
3B1	47.5	- - - -	16.8	- - -
3B2	47.5	- - - -	15.1	- - -
3C1	46.5	- - - -	15.7	- - -
3C2	47.5	- - - -	9.4	- - -
3C3	47.5	- - - -	8.9	- - -
3C4	47.5	- - - -	7.4	- - -
3S1	46.5	K= 5.60	18.3	23.9
3S2	47.5	K= 5.60	15.3	21.9
3S3	44.5	K= 5.60	14.5	21.3
3S4	47.5	K= 5.60	13.9	20.9
3S5	47.5	K= 5.60	7.7	15.6
3S6	44.5	K= 5.60	7.6	15.4
3S7	47.5	K= 5.60	7.2	15.0
3S8	47.5	K= 5.60	8.1	15.9
3S9	47.5	K= 5.60	7.7	15.6
3S10	48.0	K= 5.60	14.8	21.5
3S11	48.0	K= 5.60	14.3	21.2
SOURCE	3.0	SOURCE	50.3	208.2

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PIPE DATA

PIPE TAG / END NODES	ELEV. (FT)	NOZ. (K)	PT (PSI)	DISC. (GPM)	Q(GPM) VEL(FPS)	DIA(IN) HW(C) FL/FT	LENGTH (FT)		PRESS. SUM. (PSI)
Pipe: 1					208.2	6.357 PL	1.00	PF	0.0
SOURCE	3.0	SRCE	50.3	(N/A)	2.1	120 FTG	----	PE	0.0
BFPI	3.0	0.0	50.3	0.0		0.002 TL	1.00	PV	
Pipe: 2					FIXED PRESSURE LOSS DEVICE				
BFPI	3.0	0.0	50.3	0.0	5.0 psi, 208.2 gpm				
BFPO	3.0	0.0	45.3	0.0					
Pipe: 3					208.2	6.357 PL	2.00	PF	0.0
BFPO	3.0	0.0	45.3	0.0	2.1	120 FTG	----	PE	0.0
BOR	3.0	0.0	45.3	0.0		0.002 TL	2.00	PV	
Pipe: 4					208.2	6.357 PL	4.00	PF	0.1
BOR	3.0	0.0	45.3	0.0	2.1	120 FTG	TCB	PE	-1.7
TOR	7.0	0.0	43.4	0.0		0.002 TL	95.00	PV	
Pipe: 5					208.2	6.357 PL	40.00	PF	0.2
TOR	7.0	0.0	43.4	0.0	2.1	120 FTG	5E	PE	-1.0
0A	9.3	0.0	42.2	0.0		0.002 TL	130.00	PV	
Pipe: 6					208.2	4.260 PL	45.67	PF	1.2
0A	9.3	0.0	42.2	0.0	4.7	120 FTG	2ETB	PE	-15.5
3A	45.0	0.0	25.6	0.0		0.011 TL	113.67	PV	
Pipe: 7					208.2	4.260 PL	285.00	PF	5.1
3A	45.0	0.0	25.6	0.0	4.7	120 FTG	5E3TCB	PE	-0.6
3B	46.5	0.0	19.8	0.0		0.011 TL	473.00	PV	
Pipe: 8					141.1	4.260 PL	1.00	PF	0.0
3B	46.5	0.0	19.8	0.0	3.2	120 FTG	----	PE	0.0
3C	46.5	0.0	19.8	0.0		0.005 TL	1.00	PV	
Pipe: 9					42.7	4.260 PL	3.25	PF	0.0
3C	46.5	0.0	19.8	0.0	1.0	120 FTG	----	PE	0.0
3D	46.5	0.0	19.8	0.0		0.001 TL	3.25	PV	
Pipe: 10					67.1	1.610 PL	2.25	PF	1.6
3B	46.5	0.0	19.8	0.0	10.6	120 FTG	T	PE	0.0
3S1	46.5	5.6	18.3	23.9		0.152 TL	10.25	PV	
Pipe: 10A					43.2	1.610 PL	7.75	PF	1.1
3S1	46.5	5.6	18.3	23.9	6.8	120 FTG	2E	PE	-0.4
3B1	47.5	0.0	16.8	0.0		0.067 TL	15.75	PV	
Pipe: 11					98.4	1.610 PL	5.25	PF	4.1
3C	46.5	0.0	19.8	0.0	15.5	120 FTG	T	PE	0.0
3C1	46.5	0.0	15.7	0.0		0.308 TL	13.25	PV	
Pipe: 12					77.5	1.610 PL	13.75	PF	5.9
3C1	46.5	0.0	15.7	0.0	12.2	120 FTG	4E	PE	-0.4
3C2	47.5	0.0	9.4	0.0		0.198 TL	29.75	PV	

PIPE TAG / END NODES	ELEV. (FT)	NOZ. (K)	PT (PSI)	DISC. (GPM)	Q(GPM) VEL(FPS)	DIA(IN) HW(C) FL/FT	LENGTH (FT)		PRESS. SUM. (PSI)
Pipe: 13					31.5	1.610 PL	14.00	PF	0.5
3C2	47.5	0.0	9.4	0.0	5.0	120 FTG	----	PE	0.0
3C3	47.5	0.0	8.9	0.0		0.037 TL	14.00	PV	
Pipe: 14					43.2	1.380 PL	4.25	PF	1.5
3B1	47.5	0.0	16.8	0.0	9.3	120 FTG	T	PE	0.0
3S2	47.5	5.6	15.3	21.9		0.142 TL	10.25	PV	
Pipe: 15					21.3	1.380 PL	5.50	PF	0.2
3S2	47.5	5.6	15.3	21.9	4.6	120 FTG	----	PE	0.0
3B2	47.5	0.0	15.1	0.0		0.038 TL	5.50	PV	
Pipe: 16					21.3	1.049 PL	9.00	PF	1.9
3B2	47.5	0.0	15.1	0.0	7.9	120 FTG	2E	PE	1.3
3S3	44.5	5.6	14.5	21.3		0.146 TL	13.00	PV	
Pipe: 17					20.9	1.049 PL	3.00	PF	1.4
3C1	46.5	0.0	15.7	0.0	7.7	120 FTG	ET	PE	-0.4
3S4	47.5	5.6	13.9	20.9		0.141 TL	10.00	PV	
Pipe: 18					46.0	1.380 PL	4.50	PF	1.7
3C2	47.5	0.0	9.4	0.0	9.9	120 FTG	T	PE	0.0
3S5	47.5	5.6	7.7	15.6		0.160 TL	10.50	PV	
Pipe: 19					30.4	1.380 PL	5.00	PF	0.4
3S5	47.5	5.6	7.7	15.6	6.5	120 FTG	----	PE	0.0
3C4	47.5	0.0	7.4	0.0		0.074 TL	5.00	PV	
Pipe: 20					15.4	1.049 PL	9.00	PF	1.0
3C4	47.5	0.0	7.4	0.0	5.7	120 FTG	2E	PE	1.3
3S6	44.5	5.6	7.6	15.4		0.081 TL	13.00	PV	
Pipe: 21					15.0	1.380 PL	9.00	PF	0.2
3C4	47.5	0.0	7.4	0.0	3.2	120 FTG	----	PE	0.0
3S7	47.5	5.6	7.2	15.0		0.020 TL	9.00	PV	
Pipe: 22					31.5	1.380 PL	4.50	PF	0.8
3C3	47.5	0.0	8.9	0.0	6.8	120 FTG	T	PE	0.0
3S8	47.5	5.6	8.1	15.9		0.079 TL	10.50	PV	
Pipe: 23					15.6	1.380 PL	14.00	PF	0.3
3S8	47.5	5.6	8.1	15.9	3.3	120 FTG	----	PE	0.0
3S9	47.5	5.6	7.7	15.6		0.022 TL	14.00	PV	
Pipe: 24					42.7	1.380 PL	10.50	PF	4.4
3D	46.5	0.0	19.8	0.0	9.2	120 FTG	5ET	PE	-0.6
3S10	48.0	5.6	14.8	21.5		0.139 TL	31.50	PV	
Pipe: 25					21.2	1.380 PL	12.00	PF	0.5
3S10	48.0	5.6	14.8	21.5	4.5	120 FTG	----	PE	0.0
3S11	48.0	5.6	14.3	21.2		0.038 TL	12.00	PV	

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NOTES (HASS):

(1) Calculations were performed by the HASS 2023 D computer program in accordance with NFPA (2020) under license no. 65847320 granted by

HRS Systems, Inc.
208 Southside Square
Petersburg, TN 37144
(931) 659-9760

(2) The system has been calculated to provide an average imbalance at each node of 0.004 gpm and a maximum imbalance at any node of 0.112 gpm.

(3) Total pressure at each node is used in balancing the system. Maximum water velocity is 15.5 ft/sec at pipe 11.

(4) Items listed in bold print on the cover sheet

are automatically transferred from the calculation report.

(5) Fullflow calculations are not done for systems with variable speed pumps.

(6) PIPE FITTINGS TABLE

HASS Pipe Table Name: standard

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NTee
	F F45Ell								
1.049	2.00	5.00	2.00	5.00	6.00	1.00	10.00	2.00	5.00
	1.00								
1.380	3.00	6.00	2.00	7.00	6.00	1.00	10.00	10.00	6.00
	1.50								
1.610	4.00	8.00	2.00	9.00	6.00	1.00	10.00	10.00	8.00
	2.00								

PAGE: B MATERIAL: THNWL HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NPTee
	F F45Ell								
4.260	13.00	26.00	8.00	29.00	16.00	3.00	26.00	26.00	26.00
	6.50								
6.357	18.00	38.00	11.00	40.00	13.00	4.00	35.00	35.00	38.00
	9.00								

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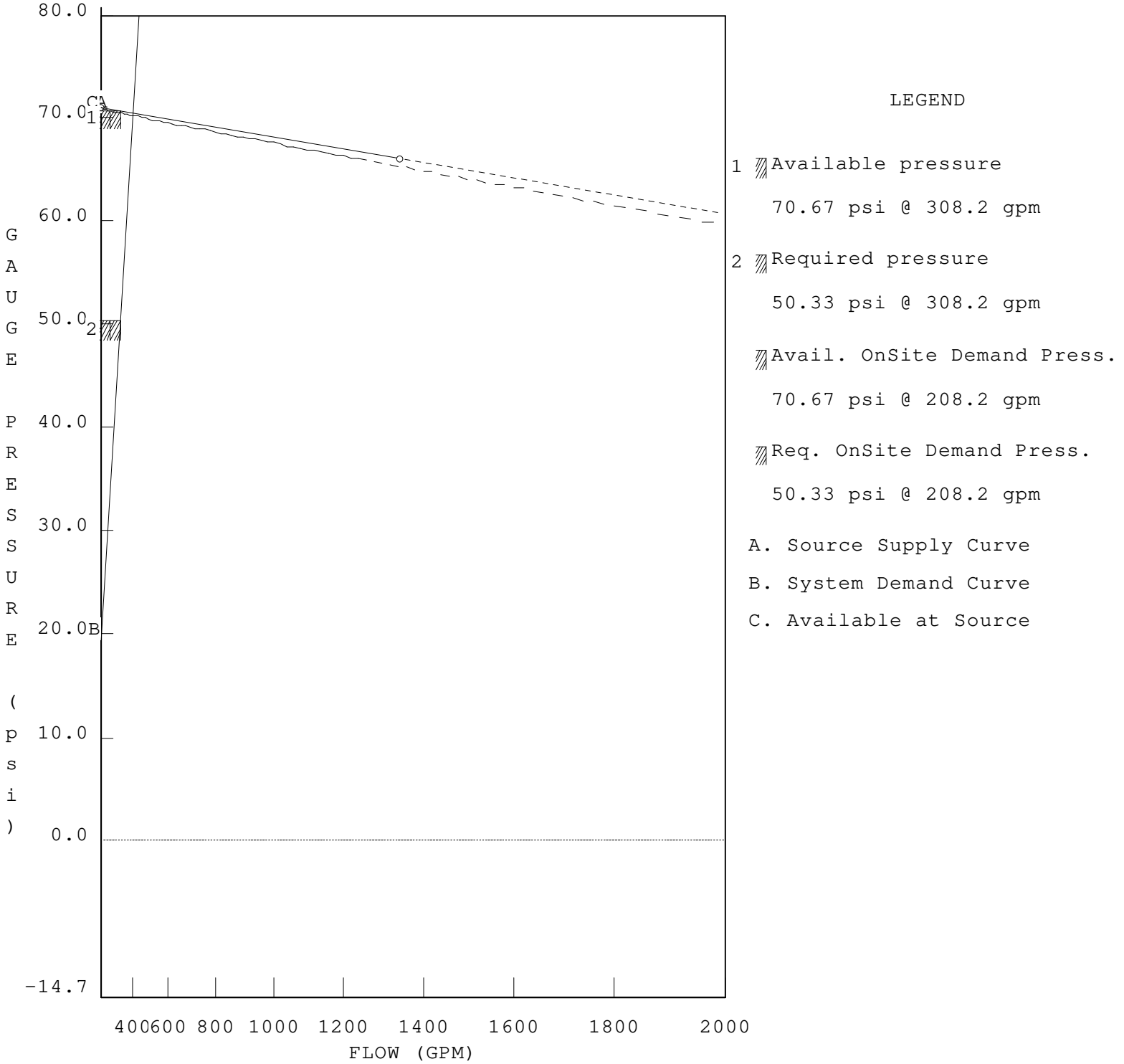
WATER SUPPLY ANALYSIS

Static: 71.00 psi Resid: 66.00 psi Flow: 1343.0 gpm



Note: (1) Dashed Lines indicate extrapolated values from Test Results

(2) On Site pressures are based on hose stream deduction at the source

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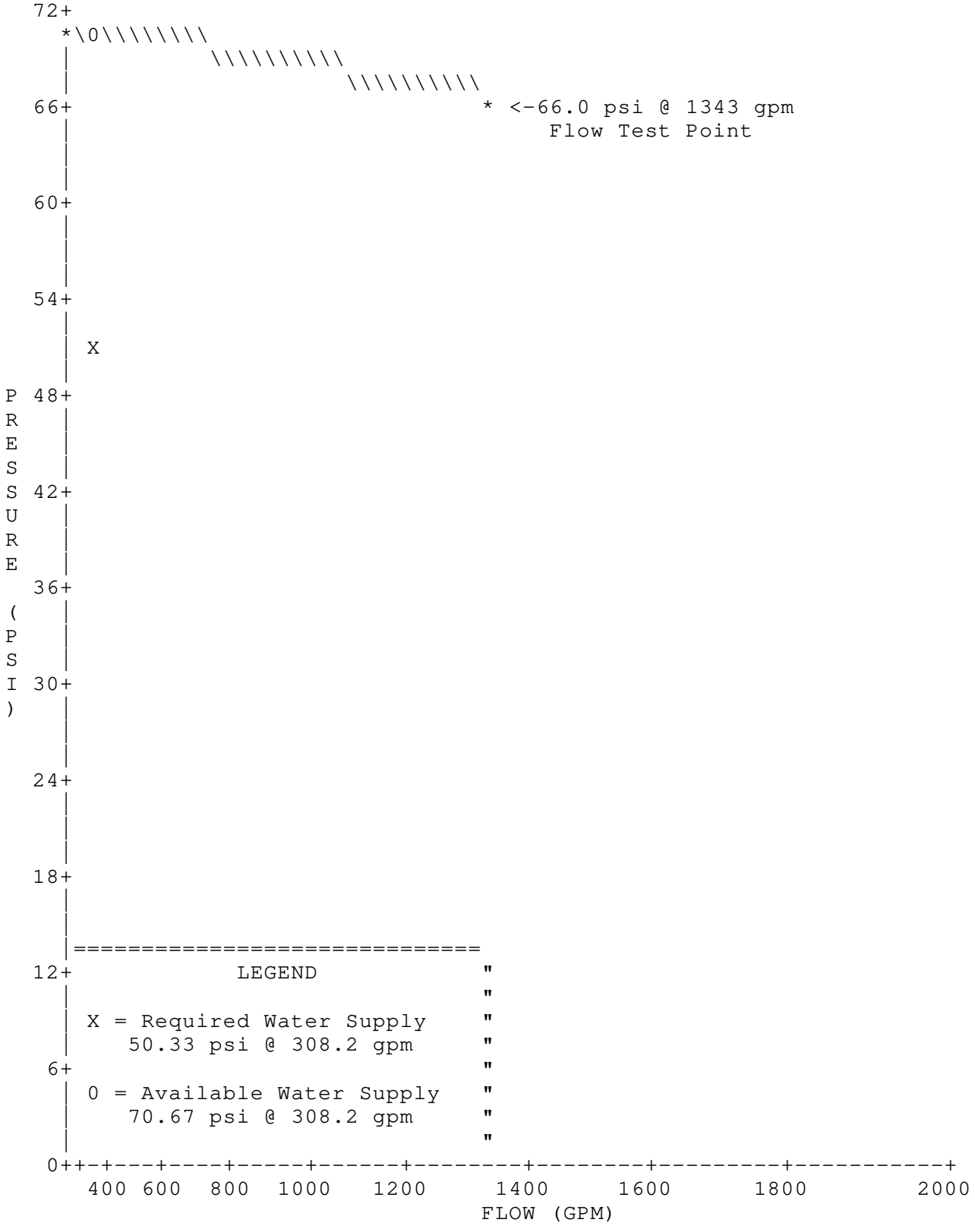
WATER SUPPLY CURVE



SECTION 32 9433
EXTERIOR CONCRETE PLANTERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory Finished Units: glass fiber reinforced concrete (GFRC) precast planters with accessories for complete installation

1.02 RELATED REQUIREMENTS

A. Section 03 3300 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 05 5113 - Metal Pan Stairs: Handrails other than those specified in this section.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

- ASTM C 33-99: Concrete Aggregates.
- ASTM C 150-98: Portland Cement.

B. ASTM C 979-82(1993): Pigments for Integrally Colored Concrete.

C. American Welding Society (AWS) D1.1-88: Structural Welding Code, Steel.

D. Prestressed Concrete Institute (PCI) MNL-128-87: Recommended Practice for Glass Fiber Reinforced Concrete Panels.

E. Prestressed Concrete Institute (PCI) MNL-117-77: Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products

1.04 SUBMITTALS

A. See Section 01 3300 - for submittal procedures.

B. Product Data: Submit Manufacturer's Literature

C. Shop Drawings: Show detailing including component dimensions, drainage, and accessories if applicable.

PART 2 PRODUCTS

2.01 MANUFACTURERS:

A. Except as otherwise specified, materials shall be products of the following manufacturers (basis of design):

1. FS Industries
2. Bohlmann Quality Products
3. Doty & Sons
4. Substitutions: See Section 01 6000 - Product Requirements.

i) Materials selected for coating systems for each type surface shall be product of a single manufacturer, unless otherwise specified

2.02 RECTANGULAR CONCRETE PLANTER

A. Large Security Planter with Forklift Knockouts - one-piece casting reinforced with a welded rebar cage. Include recessed bases and drain holes as required to maintain the proper moisture level Provide Sizes as shown on plans.

B. Model Numbers	Size	Weight
a. **P-4824REC**	48"L x 24"W x 24"H	955
c. **P-4830REC**	48"L x 24"W x 30"H	1100
e. **P-7224REC**	72"L x 24"W x 24"H	1400
g. **P-7230REC**	72"L x 24"W x 30"H	1525
i. **P-723636REC**	72"L x 36"W x 36"H	3150
k. **P-9624REC**	96"L x 24"W x 24"H	1720
m. **P-9630REC**	96"L x 24"W x 30"H	2060

C. Finishes: To be selected by the Architect from Manufacturer's full line of options.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and prepare site location to receive planter. Ensure site is free of debris and level in accordance with manufacturer's requirements.

B. Coordinate equipment permitting and site access necessary to move and install planters with the Owner and Local Municipality as required.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Anchor planters securely to sub structure as required by the manufacturer.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION