EXHIBIT C: SPECIFICATIONS
SPECIFICATION TABLE OF CONTENTS

DIVISION 1 – GENERAL REQUIREMENTS

01 10 00 – SUMMARY OF WORK
01 31 46 – SPECIAL REQUIREMENTS FOR MECHANICAL AND ELECTRICAL WORK
01 33 00 – SUBMITTALS
01 73 29 – REMOVALS, CUTTING, AND PATCHING
01 74 19 – CONSTRUCTION WASTE MANAGEMENT
01 77 00 – CONTRACT CLOSEOUT REQUIREMENTS

DIVISION 2 – EXISTING CONDITIONS

02 08 30 – REMOVAL OF UNIVERSAL WASTE AND MISCELLANEOUS HAZARDOUS MATERIALS
02 41 13 – SELECTIVE REMOVALS AND DEMOLITION

DIVISION 3 – CONCRETE

NONE

DIVISION 4 – MASONRY

04 01 42 – UNIT MASONRY - PATCHING

DIVISION 5 – METALS

05 17 00 – SUPPORT SYSTEM FOR SUSPENDED CEILINGS
05 50 00 – METAL FABRICATIONS
05 71 00 – MISCELLANEOUS METALS

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

06 10 00 – ROUGH CARPENTRY
06 10 53 – WOOD NAILERS AND BLOCKING

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07 21 00 – BUILDING INSULATION
07 81 00 – APPLIED FIREPROOFING
07 84 00 – FIRESTOPPING
07 92 00 – JOINT SEALANTS

TABLE OF CONTENTS - 1
DIVISION 8 – OPENINGS

08 11 13 – HOLLOW METAL DOORS AND FRAMES
08 31 13 – ACCESS DOORS AND FRAMES
08 71 00 – DOOR HARDWARE
08 81 00 – GLAZING
08 87 16 – WINDOW FILM
08 88 13 – FIRE RESISTANT GLAZING

DIVISION 9 – FINISHES

09 22 13 – NON-LOAD BEARING FRAMING AND FURRING
09 29 00 – GYPSUM BOARD ASSEMBLIES
09 50 00 – ACOUSTICAL CEILINGS
09 65 19 – RESILIENT TILE FLOORING AND BASE
09 91 00 – PAINTING
09 70 50 – URETHANE CEMENT COMPOSITION FLOORING

DIVISION 10 – SPECIALTIES

10 52 00 – EYE AND FACE WASH

DIVISION 11 – EQUIPMENT

NONE

DIVISION 12 – FURNISHINGS

12 24 94 - WINDOW TREATMENTS

DIVISION 13 – SPECIAL CONSTRUCTION

NONE

DIVISION 14 – CONVEYING EQUIPMENT

NONE

DIVISION 23 – HVAC

NONE

DIVISION 26 – ELECTRICAL

NONE
## DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

NONE

## DRAWING LIST

### ARCHITECTURAL

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-000.00</td>
<td>COVER SHEET</td>
</tr>
<tr>
<td>G-001.00</td>
<td>GEN. NOTES, LEGEND, SYMBOLS, ABBREVIATIONS &amp; DRAWING LIST</td>
</tr>
<tr>
<td>G-002.00</td>
<td>FLOOD INSURANCE RATE MAP 2013 PRELIMINARY</td>
</tr>
<tr>
<td>G-003.00</td>
<td>FLOOD INSURANCE RATE MAP 2007</td>
</tr>
<tr>
<td>G-004.00</td>
<td>6TH FLOOR LIFE SAFETY PLAN</td>
</tr>
<tr>
<td>DM-100.00</td>
<td>6TH FLOOR DEMOLITION PLAN</td>
</tr>
<tr>
<td>DM-101.00</td>
<td>6TH FLOOR REFLECTED CEILING DEMOLITION PLAN</td>
</tr>
<tr>
<td>DM-102.00</td>
<td>5TH FLOOR CEILING AND FLOOR DEMOLITION PLANS</td>
</tr>
<tr>
<td>DM-103.00</td>
<td>ROOF DEMOLITION PLAN</td>
</tr>
<tr>
<td>DM-104.00</td>
<td>D633 FURNITURE DEMOLITION PLAN, SCHEDULE &amp; IMAGES</td>
</tr>
<tr>
<td>A-100.00</td>
<td>6TH FLOOR CONSTRUCTION PLAN</td>
</tr>
<tr>
<td>A-101.00</td>
<td>PARTIAL 5TH FLOOR CONSTRUCTION PLAN</td>
</tr>
<tr>
<td>A-102.00</td>
<td>ROOF PLAN</td>
</tr>
<tr>
<td>A-200.00</td>
<td>INTERIOR ELEVATIONS</td>
</tr>
<tr>
<td>A-400.00</td>
<td>6TH FLOOR REFLECTED CEILING PLAN AND LIGHTING SCHEDULE</td>
</tr>
<tr>
<td>A-401.00</td>
<td>5TH FLOOR REFLECTED CEILING PLAN</td>
</tr>
<tr>
<td>A-700.00</td>
<td>PARTITION SCHEDULE, DOOR &amp; WINDOW SCHEDULE AND DETAILS</td>
</tr>
<tr>
<td>A-701.00</td>
<td>6TH FLOOR CEILING HOOKS LAYOUT &amp; SUPPORT DETAILS</td>
</tr>
<tr>
<td>A-702.00</td>
<td>FIRESTOPPING DETAILS</td>
</tr>
<tr>
<td>A-800.00</td>
<td>FINISH FLOOR PLAN AND SCHEDULES</td>
</tr>
<tr>
<td>A-801.00</td>
<td>FURNITURE-POWER PLANS, SCHEDULES AND DETAILS</td>
</tr>
</tbody>
</table>

### MECHANICAL

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN-001.00</td>
<td>ENERGY CODE COMPLIANCE HVAC</td>
</tr>
<tr>
<td>EN-002.00</td>
<td>ENERGY CODE COMPLIANCE 6TH FLOOR LIGHTING PART PLAN</td>
</tr>
<tr>
<td>M-001.00</td>
<td>ABBREVIATIONS, SYMBOLS AND GENERAL NOTES</td>
</tr>
<tr>
<td>M-002.00</td>
<td>HVAC SPECIFICATION</td>
</tr>
<tr>
<td>M-003.00</td>
<td>HVAC SPECIFICATION</td>
</tr>
<tr>
<td>M-004.00</td>
<td>HVAC SPECIFICATION</td>
</tr>
<tr>
<td>M-005.00</td>
<td>HVAC SPECIFICATION</td>
</tr>
<tr>
<td>M-006.00</td>
<td>HVAC SPECIFICATION</td>
</tr>
</tbody>
</table>
FASHION INSTITUTE OF TECHNOLOGY
FRED P. POMERANTZ ART & DESIGN CENTER
D633 SCULPTURE LAB RENOVATION

M-011.00  6TH FLOOR AND ROOF PART PLANS DEMOLITION WORK
M-100.00  6TH FLOOR AND ROOF PART PLANS NEW WORK
M-700.00  HVAC DETAILS
M-701.00  HVAC DETAILS
M-800.00  HVAC CONTROLS

ELECTRICAL

E-001.00  SYMBOL LIST, NOTES, AND ABBREVIATIONS
E-002.00  ELECTRICAL SPECIFICATIONS
E-011.00  6TH FLOOR DEMOLITION PART PLAN
E-101.00  6TH FLOOR POWER PART PLAN
E-201.00  6TH FLOOR LIGHTING PART PLAN & SCHEDULE

PLUMBING

P-001.00  SYMBOL LIST, SCHEDULES AND NOTES
P-050.00  PARTIAL 5TH & 6TH FLOOR PLAN DEMOLITION
P-100.00  PARTIAL 5TH & 6TH FLOOR PLAN NEW WORK
P-300.00  PLUMBING WORK SPECIFICATION
P-400.00  DETAILS

SPRINKLER

SP-001.00  SYMBOL LIST, NOTES, SCHEDULES, AND DETAILS
SP-050.00  PARTIAL 6TH FLOOR PLAN DEMOLITION
SP-100.00  PARTIAL 5TH & 6TH FLOOR PLAN NEW WORK
SP-200.00  RISER DIAGRAM AND PLOT PLAN
SP-300.00  SPRINKLER WORK SPECIFICATION

END OF TABLE OF CONTENTS
PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The work to be done under the Contract, in accordance with the Contract Documents, consists of performing, installing, furnishing and supplying all materials, equipment, labor and incidentals necessary or convenient for the construction of the referenced renovation project at the Fashion Institute of Technology and carrying out all of the duties and obligations imposed upon the Contractor by the Contract Documents.

B. Contractor shall provide temporary lighting for the duration of the Project.

C. The main features of the work as indicated in plans shall include, but not be limited to the following:

Project Scope:
1. Asbestos contaminated material will be removed by a certified asbestos remover prior to the work of this contract.
2. General Contractor is responsible to coordinate with Mechanical and Electrical Contractors and provide coordination drawings for review by the Architect/Engineer for locations of all openings and penetrations in walls, floors, and ceilings, including but not limited to outlets
3. The sequence of work is critical. The long lead items must be placed first so that shop drawings are prepared & reviewed. Students need to use this lab and move in by August 20, 2021. The Lab must be substantially complete by July 20, 2021.
4. During construction the building will be partially occupied by students. Contractor is responsible for proper staging as follows:
   a) Keep all emergency egresses open at all times.
   b) Emergency stairs may NOT be blocked at ANY time during construction and/or demolition.
   c) A three-foot wide (minimum) egress way must be maintained at all times from elevators and emergency stairways to exits for building occupants.
   d) A poly containment to be used to enclose work areas, lower dust and maintain the necessary egress.
Demolition:
- Remove portions of existing CMU walls.
- Removal of (3) sinks.
- Removal of air-filter exhaust system.
- Removal of kiln hood.
- Removal of 2x2 and 1x1 hung ceiling.
- Removal of GWB soffit and remove and save exit sign.
- Removal of 2x4 and 1x4 light fixtures.
- Remove and save existing electrical panel.
- Remove and save existing thermostat.
- Remove and reinstall dust collection system
- Removal exhaust fans on the roof.

Construction:
- New 2 hour rated walls.
- New fire rated doors and window.
- New sinks with sediment traps
- New cabinets
- Patch and paint walls.
- New epoxy floor and epoxy base
- New vinyl base.
- Install new eyewash
- New 2x2 and 1x1 hanged ceiling.
- New GWB soffit.
- Reinstall existing 2x4 lights fixtures.
- Install new 2x4 and 1x4 light fixtures.
- Provide back boxes and conduit for new card readers at doors
- Install accessories
- New ceiling mounted outlets
- Core drill in slab for plumbing and electrical work.
- New steel lintels above doors 1 & 3.
- New ceiling mounted retractable cord reel extensions.
- New sprinkler system
- Apply fireproofing to existing beams
- Relocate existing electrical panel
- New Kindorf steel channel system with threaded rod and eye bolts
- Reinstall exit sign and return grill on soffit.
- Reinstall thermostat
- Install new fire rated access panel
- Patch concrete slab as required.
- New exhaust fans on the roof.

1.2 RELATED SECTIONS

ALL SPECIFICATION SECTIONS
1.3 PHYSICAL COMPLETION DATE

A. Physically complete the Work within FIT's established calendar after the Agreement is approved by the College.

1.4 ITEMS NOT INCLUDED

A. The items shown on the drawings which are not included in this Contract are indicated:
   1. Items indicated “NIC” (Not in Contract).
   2. Existing construction, except where such construction is to be removed, replaced, or altered.

1.5 EXAMINATION OF PREMISES

A. Verification of Existing Conditions after Award
   1. Various existing conditions at locations of the Work which cannot be determined until removals are under way cannot be indicated on the Drawings or described in the Specifications.
   2. Perform all such removals as required to verify all existing conditions before fabricating the work.
   3. Where applicable, before disturbing any structural work, make all possible preliminary investigations to verify the existing conditions threat. Notify Architect of any existing conditions not previously documented prior to proceeding further with that part of the work.
   4. Where removals or preliminary investigations reveal existing conditions that differ materially from what is indicated or specified, or that may require changes, immediately notify the Architect in writing and await instructions before proceeding further with that part of the work.

B. Discrepancies in Existing Conditions:
   1. During the process of the Work, should conditions be encountered that materially differ from those shown on the Drawings or indicated in the Specifications, or conditions which could not reasonably have been anticipated, which conditions will materially affect the cost of the Work, such conditions shall immediately be called to the attention of the Architect, before they are further disturbed. The Architect will promptly investigate the conditions and if it is found that they do so materially differ, shall issue a clarification.
1.6 CONNECTION TO ELECTRICAL EQUIPMENT OR SYSTEMS

A. Contractor will not be allowed to tie into electrical equipment or systems until the F.I.T. Facilities Management Department has reviewed and approved the connection.
   1. Submit written procedures to the FIT Facilities Management Department, detailing how the connection Work is proposed to be performed.
   2. After procedures have been approved, notify the FIT Representative at least 3 working days prior to the connection Work so that arrangements can be made to have a FIT Facilities Management Department Representative witness the Work.

1.7 CONTRACTOR USE OF PREMISES

A. Comply with the Facility’s Visitor Identification Policy. A copy of the current policy will be distributed at the initial job meeting.
B. Work hours shall be as established by the Facilities representatives.
C. Check in with the Facility Representative, as directed, at the beginning of each work day. Furnish information regarding where employees will be working during the day and indicate what is the general nature of the work.
D. Comply with applicable Federal and State of New York Right-to-Know Law provisions and supply copies of the appropriate Material Safety Data Sheets (MSDS) to the FIT Facility’s Safety Information Officer.
E. Do not diminish the level of life safety during performance of the Work.
F. Contractor responsible to coordinate with Owner and make all necessary provisions to receive materials and remove debris.

1.8 REFERENCE SPECIFICATIONS AND STANDARDS

A. Comply with the requirements of the various standards referred to in these specifications, except where they conflict with the requirements of these specifications. In case of conflict, notify architect prior to proceeding. Such reference standards shall be the date of latest revision in effect at the time of receiving bids, unless the date is given.

1.9 LAY-OUT

A. Examine the Contract Documents thoroughly and promptly report any errors or discrepancies to the Architect before commencing the Work.
B. Lay-out the Work in accordance with the Contract Documents.
1.10 CLEAN-UP

A. Clean-up and containerize the rubbish (refuse, debris, waste materials, and removed materials and equipment) resulting from the Work at the end of each work day and leave work areas broom swept clean. Locate containerized rubbish where directed.

B. Remove piled rubbish from property at least once a week or more often if the rubbish presents a hazard. Properly dispose of rubbish. Burning of rubbish will not be permitted.

1.11 SUSTAINABILITY REQUIREMENTS

A. The Contractor shall meet sustainability performance and documentation requirements to comply with New York City Local Law, 86 of 2005, and to achieve the following objectives: sustainable site use, water use reduction, conservation of energy and resources, and improvement of indoor environmental quality.

B. Sustainability performance requirements include, but are not limited to: water use reduction, energy conservation, construction waste management, and indoor air quality controls during construction and prior to occupancy.

C. Sustainability documentation requirements include, but are not limited to, Contractor’s Certification Form, cost information, documentation on VOC content, urea-formaldehyde content and recycled and regional content.

1.12 NEW YORK CITY CODE OF 2008 IMPLEMENTATION

A. Beginning July 1, 2008, Chapters 17 and 33 of the New York City Construction Code went into effect. These two chapters supersede the Controlled Inspections requirements contained in the 1968 Building Code, and Chapter 19 of the 1968 Building Code that deals with protection of the public.

1. References to “Controlled Inspections” and applicable code sections and “Controlled Inspector” referenced in the Contract Documents shall mean the equivalent “Special Inspection” and “Special Inspector” in accordance with the 2008 NYC Construction Code. It shall be noted that some individual “Controlled Inspection” items have been combined into one “Special Inspection” category.

2. References to public protective’s and code sections included in Chapter 19 of the 1968 code referenced in the Contract Documents shall mean those equivalent Sections contained in Chapter 33 of the NYC Construction Code. The Contractor shall be responsible for complying with all provisions of Chapter 33 of the NYC Construction Code.

END OF SECTION 01 10 00
# SECTION 01 31 46

## SPECIAL REQUIREMENTS FOR MECHANICAL AND ELECTRICAL WORK

<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
<th>PAGE No</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART 1 - GENERAL</td>
<td>1</td>
</tr>
<tr>
<td>1.01 RELATED DOCUMENTS</td>
<td>1</td>
</tr>
<tr>
<td>1.02 DEFINITIONS</td>
<td>1</td>
</tr>
<tr>
<td>1.03 CODES AND STANDARDS</td>
<td>2</td>
</tr>
<tr>
<td>1.04 INTENT</td>
<td>2</td>
</tr>
<tr>
<td>1.05 DRAWINGS</td>
<td>3</td>
</tr>
<tr>
<td>1.06 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS</td>
<td>3</td>
</tr>
<tr>
<td>1.07 VISITING THE SITE</td>
<td>3</td>
</tr>
<tr>
<td>1.08 EQUIPMENT AND MATERIALS</td>
<td>4</td>
</tr>
<tr>
<td>1.09 SHOP DRAWINGS</td>
<td>5</td>
</tr>
<tr>
<td>1.10 RECORD DRAWINGS</td>
<td>7</td>
</tr>
<tr>
<td>1.11 LAWS, ORDINANCES, PERMITS AND FEES</td>
<td>7</td>
</tr>
<tr>
<td>1.12 ORGANIZATION OF WORK</td>
<td>8</td>
</tr>
<tr>
<td>1.13 PROTECTION OF WORK AND PROPERTY</td>
<td>9</td>
</tr>
<tr>
<td>1.14 TEMPORARY OPENINGS</td>
<td>9</td>
</tr>
<tr>
<td>1.15 SHUTDOWNS</td>
<td>9</td>
</tr>
<tr>
<td>1.16 PIPE EXPANSION</td>
<td>9</td>
</tr>
<tr>
<td>1.17 SCAFFOLDING, RIGGING, HOISTING</td>
<td>10</td>
</tr>
<tr>
<td>1.18 BASES AND SUPPORTS</td>
<td>10</td>
</tr>
<tr>
<td>1.19 SLEEVES, PIPE AND CONDUIT INSERTS AND ANCHOR BOLTS</td>
<td>10</td>
</tr>
<tr>
<td>1.20 ESCUTCHEONS</td>
<td>12</td>
</tr>
<tr>
<td>1.21 MANUFACTURERS' IDENTIFICATION</td>
<td>12</td>
</tr>
<tr>
<td>1.22 EQUIPMENT NAMEPLATES</td>
<td>12</td>
</tr>
<tr>
<td>1.23 TAGS AND CHARTS</td>
<td>12</td>
</tr>
<tr>
<td>1.24 IDENTIFICATION</td>
<td>13</td>
</tr>
<tr>
<td>1.25 COORDINATION OF MECHANICAL AND ELECTRICAL EQUIPMENT LOCATIONS</td>
<td>16</td>
</tr>
<tr>
<td>1.26 TOOLS</td>
<td>16</td>
</tr>
<tr>
<td>1.27 QUIET OPERATION</td>
<td>16</td>
</tr>
<tr>
<td>1.28 RUBBISH REMOVAL</td>
<td>16</td>
</tr>
<tr>
<td>1.29 CLEANING, PIPING, DUCTS AND EQUIPMENT</td>
<td>16</td>
</tr>
<tr>
<td>1.30 DELIVERY OF MATERIAL</td>
<td>17</td>
</tr>
<tr>
<td>1.31 CUTTING AND PATCHING (IN EXISTING CONSTRUCTION)</td>
<td>17</td>
</tr>
<tr>
<td>1.32 ALTERATIONS</td>
<td>17</td>
</tr>
<tr>
<td>1.33 PAINTING</td>
<td>18</td>
</tr>
<tr>
<td>1.34 LUBRICATION</td>
<td>19</td>
</tr>
<tr>
<td>1.35 TESTS</td>
<td>19</td>
</tr>
<tr>
<td>1.36 OPERATING INSTRUCTIONS</td>
<td>20</td>
</tr>
<tr>
<td>1.37 INSTRUCTION OF OWNER'S PERSONNEL</td>
<td>21</td>
</tr>
<tr>
<td>1.38 GUARANTEE</td>
<td>21</td>
</tr>
<tr>
<td>1.39 OPERATION PRIOR TO COMPLETION</td>
<td>22</td>
</tr>
<tr>
<td>1.40 INSTALLATION OF MOTORS AND CONTROL EQUIPMENT</td>
<td>22</td>
</tr>
<tr>
<td>1.41 SEMI-FINAL AND FINAL SITE VISITS FOR OBSERVATION</td>
<td>24</td>
</tr>
<tr>
<td>PART 2 - PRODUCTS - (NOT USED)</td>
<td>24</td>
</tr>
<tr>
<td>PART 3 - EXECUTION</td>
<td>24</td>
</tr>
<tr>
<td>3.01 INSTALLATION OF EQUIPMENT</td>
<td>24</td>
</tr>
</tbody>
</table>
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. This Section is coordinate with and complementary to the General Conditions, General Requirements and Supplementary General Requirements, wherever applicable to Mechanical and Electrical Work.

B. Where items of the General Conditions are repeated in this Section of the Specifications, it is intended to qualify or to call particular attention to them; it is not intended that any other parts of the General Conditions shall be assumed to be omitted if not repeated herein.

C. This Section applies equally and specifically to all Contractors and Subcontractors supplying labor and/or equipment and/or materials as required under the Heating, Ventilating and Air Conditioning, Plumbing, Sprinkler and Electrical Sections of the Specifications.

1.02 DEFINITIONS

A. "The Contractor" or "Each Contractor" means specifically, the Contractor or Subcontractor working under his respective Section (Heating, Ventilating and Air Conditioning, Plumbing, Sprinkler or Electrical) of this Specification.

B. "Provide" means to supply, erect, install, and connect up in complete readiness for regular operation, the particular work referred to.

C. "Furnish" means to supply and deliver to the job.

D. "Piping" includes, in addition to pipe, all fittings, valves, hangers, and other accessories related to such piping.

E. "Concealed" means hidden from sight as in chases, furred spaces, shafts, hung ceilings, or embedded in construction.

F. "Exposed" means "not concealed" as defined above. Work in trenches, crawl spaces, and tunnels shall be considered "exposed" unless otherwise specifically noted. Work located in mechanical rooms, accessible attics, open storage rooms, janitor’s closets, on the roof or anywhere outdoors shall be considered “exposed”.

G. "Approved equal" means any equipment or material which, in the opinion of the Architect, is equal in quality, durability, appearance, strength, design, performance, physical dimensions, and arrangement to the equipment or material specified, and will function adequately in accordance with the general design.

H. "Governmental" means all municipal, state and federal governmental agencies.

I. Where any device or part of equipment is herein referred to in the singular number (such as "the pump"), such reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the Drawings.
"HVAC" means Heating, Ventilating and Air Conditioning.

"Plumbing Contractor" means the Contractor doing Plumbing and Fire Protection Work.

1.03 CODES AND STANDARDS

A. New York City Building Code
B. New York City Energy Conservation Code
D. New York State Health Code as it applies to construction
E. NFPA National Fire Protection Association
F. ASME American Society of Mechanical Engineers
G. ANSI American National Standards Institute
H. ASTM American Society for Testing Materials
I. AWWA American Water Works Association
J. IBR Institute of Boiler and Radiator Manufacturers
K. NEMA National Electrical Manufacturers Association
L. ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
M. SMACNA Sheet Metal and Air Conditioning Contractors National Association, Inc.
N. ARI Air Conditioning and Refrigeration Institute
O. UL Underwriters' Laboratories
P. AMCA Air Moving and Conditioning Association
Q. ADC Air Diffusion Council
R. AABC Associated Air Balance Council
T. Local Water Company Rules and Regulations
U. NFPA-90A Air Conditioning and Ventilation Systems
V. National Electric Code and New York City Electric Code

1.04 INTENT
A. It is the intention of the Specifications and Drawings to call for finished work, tested, and ready for operation. All materials, equipment, and apparatus shall be new and of first-class quality.

B. Any apparatus, appliance, material, or work not shown on Drawings, but mentioned in the Specifications, or vice versa, or any incidental accessories, or minor details not shown but necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be provided without additional expense to the Owner.

1.05 DRAWINGS

A. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement of equipment; ducts, conduits, piping, and fixtures.

B. The locations of all items shown on the Drawings or called for in the Specifications that are not definitely fixed by dimensions are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project and shall have the approval of the Architect before being installed. Do not scale Drawings.

C. Follow Drawings in laying out work and check Drawings of other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points. Where headroom and space conditions appear inadequate, Architect shall be notified before proceeding with installation.

D. If directed by the Architect, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

E. Piping or ductwork connected to equipment may require different size connection than indicated on the Drawings. The Contractor shall provide transition pieces as required at the equipment.

1.06 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

A. Any questions or disagreements arising as to the true intent of this Specification or the Drawings or the kind and quality of work required thereby shall be decided by the Architect, whose interpretations thereof shall be final, conclusive, and binding on all parties.

B. In case of disagreement between Drawings and Specifications, or within either document itself, the better quality, greater quantity or more costly work shall be included in the Bid Price and the matter referred to the Architect's attention for decision and/or adjustment prior to the Contractor's submission of their Bid. If such ambiguity is identified by the Contractor during construction (after bid period), then the Architect shall be consulted merely to decide on the proper technical approach; the more costly work's value shall be included.

C. Maintain an awareness to avoid space conflict with other trades.

D. Purchase the equipment and material required in accordance with field measurements taken at the proper time during the construction progress.

1.07 VISITING THE SITE
Before submitting the final proposal, examine the site of the proposed work to determine the existing conditions that may affect the work, as this Section will be held responsible for any assumptions in regard.

### 1.08 EQUIPMENT AND MATERIALS

A. If material or equipment is installed before the Contractor obtained "No Objections" comment from the Architect, trade installing same shall be liable for the removal and replacement at no extra charge to the Owner if, in the opinion of the Architect, the material or equipment does not meet the intent of the Drawings and Specifications.

B. The words "or approved equal" are understood to follow:
   1. The name of any manufacturer, vendor, equipment or materials;
   2. Any trade name, plate number, or catalog number;
   3. Any detailed description used to define equipment or material; except where otherwise indicated on the Drawings or in the Specifications.
   4. It is the intent of these Specifications that wherever a manufacturer of a product is specified, and the terms "other approved" or "or approved equal" are used, the substituted item must conform in all respects to the specified item. Consideration will not be given to claim that the substituted item meets the performance requirements with lesser construction (such as lesser heat exchange surface, etc.) Performance as delineated in schedules and in the Specifications shall be interpreted as minimum performance.

C. All equipment and materials required for installation under these Specifications shall be new and without blemish or defect. All electrical equipment shall bear labels attesting to Underwriters' Laboratories approval. Where no specific indication as to the type or quality of the material or equipment is indicated, a first class standard article shall be furnished.

D. Where it is proposed to use an item of equipment other than that specified or detailed on the Drawings which requires any redesign of the structure, partitions, foundations, piping, wiring, or of any other part of the mechanical, electrical, or architectural layout, all such redesign, and all new drawings and detailing required therefore shall, with the review of the Architect and subsequent comments by the Architect "No Exception" or "Exception as Noted" on the shop drawings, be prepared at no additional cost to the Owner.

E. Where such deviation from contract documents requires a different quantity and arrangement of ductwork, piping, wiring, conduit, and equipment from that specified or indicated on the Drawings, furnish and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring, and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

F. All equipment of one type (such as fan, coils, etc.) shall be the product of the same manufacturer.

G. Note that the comments "No Exception" or "Exception as Noted" marked on the shop drawings or other information submitted in accordance with the requirements herein before specified does not assure that the Engineer, Architect, or any other Owner's representative attests to the dimensional accuracy or dimensional suitability of the material or equipment involved or the
mechanical performance of equipment. Comments on the shop drawings does not invalidate the Plans and Specifications if the shop drawings are in conflict with the Plans and Specifications.

1.09 SHOP DRAWINGS

A. Prior to delivery to job site, but sufficiently in advance of requirements necessary to allow Architect ample time for review, submit copies (as stated in "General Conditions") of shop drawings of all equipment, materials, piping, sleeves, conduit, ductwork, and wiring diagrams, and further obtain written comments "No Exception" or "Exception as Noted" for same from the Architect, before installing any of these items.

B. All shop drawings shall be prepared using AutoCAD. Manually drafted shop drawings are prohibited. If a Contractor is incapable of developing CAD drawings in-house, then they shall engage the services of an external drafting service in order to do so. The cost for such service shall be borne by the Contractor and included as part of their bid. Shop drawing submittals shall be on paper as described herein. While shop drawings are being developed and revised throughout the construction process, the Contractor shall continually update the CAD files. As construction approaches completion, these shop drawing CAD files will develop into “As-Built” drawings. As part of standard project close-out documents, in addition to providing conventional paper copies of As-Built Shop Drawings, the Contractor must also provide CD’s containing electronic AutoCAD versions of same.

C. Shop drawings shall consist of manufacturer's certified scale drawings, cuts, or catalogs, including descriptive literature and complete certified characteristics of equipment, showing dimensions, capacity, code requirements, motor and drive testing, as indicated on the Drawings or Specifications.

D. Certified performance curves for all pumping and fan equipment shall be submitted for review.

E. Shop drawings submitted with insufficient information shall be rejected without review.

F. Shop drawings shall be either mailed or hand delivered to the Architect. Any shop drawing information transmitted by fax shall be rejected without review.

G. Shop drawings which are larger than 11” x 17” shall be submitted in the form of a reproducible sepia with two prints. Shop drawings which are larger than 11” x 17” and which are not provided in the form noted shall be rejected without review.

H. Shop drawings submitted in insufficient number of copies shall be rejected without review.

I. Samples of materials or equipment, when requested by the Architect, shall be submitted for review.

J. Shop drawings, samples, specifications, etc. which are not labeled with all of the following information shall be rejected without review:
   1. Project name
   2. Project location
   3. Contractor's name and address, Subcontractor's name and address
   4. Applicable section and article number of specifications
   5. Contractor's approval stamp and signature
6. Submission number
7. Specific service for which material is to be used.

K. Catalogs, pamphlets, or other documents submitted to describe items on which review is being requested, shall be specific and identification in catalog, pamphlet, etc., of item submitted shall be clearly made in ink. Data of a general nature will not be accepted.

L. Shop drawings indicating an unsuitable manufacturer shall be rejected without review.

M. Ductwork shop drawings shall be drawn with double line ductwork and shall indicate the elevation above finished floor of all ducts, location and height of building structure (beams, etc.), lengths of fabrication pieces and fittings. Show new and existing work. Shop drawings submitted shall be ready for sheet metal fabrication.

N. The comments "No Exception" or "Exceptions as Noted" rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are reviewed, said review does not in any way relieve responsibility, or necessity, of furnishing material or performing work as required by the Contract Drawings and Specifications.

O. "EXCEPTIONS, AS NOTED" means, unless otherwise noted on the drawings to approved for construction, fabrication and/or manufacture subject the provision that the work shall be carried out in compliance with all annotations and/or corrections indicated on the shop drawings and in accordance with the requirements of the Contract Documents. If also marked "RESUBMIT", "EXCEPTIONS AS NOTED" is invalid and a corrected submittal of the drawing is required.

P. If a shop drawing is resubmitted and does not comply with all of the comments indicated on the previous submission(s), and does not reflect specific reasons for such non-compliance, it shall be rejected without review.

Q. Label resubmitted shop drawings with a stamp indicating the submittal number, for example: SECOND SUBMISSION; THIRD SUBMISSION, etc; and send separate transmittals for each item being submitted so that one transmittal does not cover more than one specific item or group of items from one manufacturer.

R. Failure to submit shop drawings in ample time for checking shall not entitle an extension of Contract time, and no claim for extension by reason of such default will be allowed.

S. Prior to submission of shop drawings, thoroughly check each shop drawing, reject those not conforming to the Specifications, and indicate (by signature) that the shop drawings submitted meet Contract requirements. Deviations and/or exceptions to the contract documents should be clearly noted as being deviations and/or exceptions. The Contractor will later be required to correct such deviation and/or exceptions at his own expense, if they have not been noted and approved on the shop drawing.

T. All shop drawings showing routing of ductwork, piping and conduit, shall be not less than \( \frac{3}{8}'' = 1'-'0'' \) scale.

U. Incorporate a numbering system to help keep track of shop drawing submittals as follows:
1. H ................................................................. HVAC shop drawings
2. P ................................................................. Plumbing shop drawings
3. SP.................................................................................................................. Sprinkler shop drawings
4. E.................................................................................................................. Electrical shop drawings

V. Concurrent numbers shall follow the prefix letter. Example: H-1, H-2, etc. In addition, shop drawings requiring resubmission should bear the number of the original submission and bear a suffix as follows: H-1A (second submission), H-1B (third submission), etc.

W. Before request for acceptance and final payment for the work, write a letter to the Architect stating that all shop drawings are brought to a condition "No Exception" or "Exception as Noted". Any outstanding shop drawings must be cleared with the Engineer.

X. The HVAC Contractor shall prepare ductwork shop drawings at $\frac{3}{8}$"=1'-0" scale and submit to the Architect for their approval to prepare the coordination drawings as called for in paragraph 1.14.

1.10 RECORD DRAWINGS

A. The Contractor shall furnish, coordinate, produce and distribute record drawings as stated within the General Conditions of the Contract.

B. During construction keep an accurate record of all deviations between the work as shown on the Drawings and that which is actually installed.

C. Where record drawings are CAD type, provide CD’s containing AutoCAD files of these drawings to the Architect, the Engineer and the Owner.

1.11 LAWS, ORDINANCES, PERMITS AND FEES

A. Give all necessary notices, obtain all permits and pay all governmental taxes, fees, and other costs in connection with the work; file all necessary plans, prepare all documents, and obtain all necessary approvals of all governmental departments having jurisdiction; obtain all required Certificates of Inspection for the work and deliver to the Architect before request for acceptance and final payment for the work. File for and obtain all required equipment use permits, controlled inspections, submission of fire alarm as-built drawings, backflow prevention device (BFP) sign-offs, boiler and domestic hot water heater filings with DEP and all other required filings.

B. Include in the work, without extra cost to the Owner, any labor, materials, services, apparatus, drawings, (in addition to Contract Drawings and Documents) in order to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on Drawings and/or specified.

C. All materials furnished and all work installed shall comply with the rules and recommendations of the National Fire Protection Association, with all requirements of local utility companies, with the recommendations of the fire insurance rating organization having jurisdiction, and with the requirements of all governmental departments having jurisdiction.

D. Include in the bid, without extra cost to the Owner, retaining the service of a licensed professional engineer to obtain equipment use permits, filing of sprinkler drawings with
hydraulic calculations, preparation of fire alarm as-built drawings, testing of all fire and fire smoke dampers, and approvals and all other required filings.

1.12 ORGANIZATION OF WORK

A. The work throughout shall be executed in the best and most thorough manner under the direction of and to the satisfaction of the Engineers, Owners and Architects, who will jointly interpret the meaning of the Drawings and Specifications, and shall have the power to reject any work and materials which, in their judgment, are not in full accordance therewith.

B. The work called for under this Contract shall be carried on simultaneously with the work of other trades in a manner such as not to delay the overall progress of the work. Furnish promptly to other trades involved at the project, all information and measurements relating to the work which they may require. Cooperate with them in order to secure the harmony necessary in the interest of the project as a whole.

C. Furnish and install all work as fast as possible to meet all construction schedules.

D. Keep a competent superintendent in charge of the work at all times. Such superintendent shall be replaced if unsatisfactory to the Owner.

E. Upon award of contract, consult with the Architect and negotiate with subcontractors and manufacturers, and within thirty (30) days submit five (5) copies of a preliminary list of major equipment, for approval, complete with name of manufacturer, dates of purchase orders, and delivery dates to the site. Also submit within thirty (30) days, five (5) copies of a preliminary schedule of installation of the various systems. This list shall be revised monthly and five (5) copies shall be submitted. The second submittal shall contain the names of manufacturers of scheduled equipment (with names, addresses, and telephone numbers of local representatives).

F. Maintain a complete file of shop drawings at all times available to the Owner's representative.

G. Every facility shall be provided to permit inspection of the work by the Owner's representative during the course of construction.

H. Where items of equipment and/or materials are indicated in the Specifications as being furnished by other trades for installation, assume responsibility for the unloading of such equipment and/or materials from the delivery trucks, and for providing safe storage for same as required pending installation.

I. Where the work is to be installed in close proximity to work of other trades, or where there is evidence that the work is to interfere with work of other trades, assist in working out space conditions to make a satisfactory adjustment.

J. If so directed by the Architect, prepare composite working drawings and sections at a suitable scale not less than \(\frac{3}{16}" = 1\text{-}0"\) clearly showing how the work is to be installed in relation to the work of other trades. If the installation is made before coordinating with other trades, make all necessary changes in the work without extra charge to the Owner.

K. Before Submitting shop drawings for sleeves, piping and ductwork, the Heating, Ventilating and Air Conditioning Contractor shall prepare a combined \(\frac{3}{8}" = 1\text{-}0"\) scale shop drawing for piping
and ductwork indicating location of piping and ductwork with dimensions for each floor and Mechanical Rooms. A transparent copy of these shop drawings shall be given to the Electrical Contractor. The Electrical Contractor shall indicate the location of all lighting fixtures and conduit runs on these shop drawings. The Electrical Contractor shall give the transparent copy of these shop drawings, with lighting fixtures and conduit runs indicated to the Plumbing Contractor. The Plumbing and Sprinkler Contractor shall indicate his piping on these shop drawings. Each Contractor shall keep each transparent copy not more than three (3) working days.

L. The Heating, Ventilating and Air Conditioning Contractor shall arrange a Coordination Meeting for each floor and Mechanical Equipment Room with Plumbing and Electrical Contractors under the supervision of the General Contractor. After coordination, each Contractor shall sign the transparent copy. The Heating, Ventilating and Air Conditioning Contractor shall submit these drawings to the Architect for review and he shall call any conflicts that could not be resolved in the coordination meetings, and/or deviation from original design, to the Architect's attention. After receiving written review from the Architect, each Contractor shall prepare the shop drawings as required under the paragraph "Shop Drawings" in the Specifications.

1.13 PROTECTION OF WORK AND PROPERTY

A. Maintain and protect all equipment, materials and tools from loss or damage from all causes until final acceptance by the Owner.

B. Assume responsibility for the protection of any finished work or other trades from damage or defacement by the operations and remedy any such injury or damages.

1.14 TEMPORARY OPENINGS

A. Ascertain from examination of the Architectural Drawings whether any special temporary openings in the building will be required for the admission of apparatus provided under the Contract and notify the Architect accordingly. In the event of failure to give sufficient notice to the Architect in time to arrange for these openings during construction, assume all costs of providing such openings thereafter.

1.15 SHUTDOWNS

A. When installation of a new system requires the temporary shutdown of an existing operating system, the connection of the new system shall be performed at such regular time or at overtime when designated by the Owner at no additional cost to the Owner.

B. The Owner shall be notified of the estimated duration of the shutdown period at least ten (10) days in advance of the date the work is to be performed.

C. Work shall be arranged for continuous performance, including overtime, when approved by the Owner, if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.

1.16 PIPE EXPANSION

A. All pipe connections shall be installed to allow for freedom of movement of the pipe during the expansion and contraction without proper anchors and guides shall be provided where necessary.
and/or when shown on the Drawings. Anchors and guides shall be subject to the review of the Architect. Provide pipe support and expansion calculations by an independent Professional Engineer, using the project’s piping shop drawings.

1.17 SCAFFOLDING, RIGGING, HOISTING

A. Provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises of all equipment and materials furnished under this Section of the Specifications, and remove same from premises when no longer required.

B. In the event that supplementary bracing of the basic building structure is required to assure a secure rigging procedure and a secure route for the equipment being handled, assume full responsibility for such supplementary bracing.

1.18 BASES AND SUPPORTS

A. Provide all bases and supports not part of the building structure of required size, type and strength, as approved by the Architect, for all equipment and materials furnished by him. All equipment, bases, and supports shall be adequately anchored to the building structure to prevent shifting of position under operating conditions.

B. The Section furnishing the equipment shall provide not less than six-inch high concrete bases for all pumps, refrigeration machines, compressors, fans, humidifier units, air handlers, boilers, etc. and rotating machinery. Bases shall extend six inches beyond machinery base in all directions, with top edge chamfered. Provide ½” x 6” steel dowels into floors to anchor bases. Provide anchor bolts set in pipe sleeves, two sizes larger than anchor bolts for securing machinery. After anchor bolts are aligned with equipment bases, fill sleeves with concrete and allow to set.

C. Concrete pads shall also be provided below any floor-mounted duct support, pipe support and electrical panel support (including switchboards, power panels, starters, VFDs, pull boxes, etc.). Provide six inch high concrete pads below the mounting feet of any of the above duct, pipe or equipment support legs. Provide connection hardware (anchor bolts) as described above for rotating equipment.

D. Concrete bases are specified under other Sections of the Specification. Each Contractor shall furnish dimensioned drawings to the General Contractor. Steel dowels, sleeves and anchor bolts shall be furnished and set by the Contractor.

1.19 SLEEVES, PIPE AND CONDUIT INSERTS AND ANCHOR BOLTS

A. Provide and assume responsibility for the location and maintenance in proper position of all sleeves, inserts, and anchor bolts required for the work. In the event that failure to do so requires cutting and patching of finished work, it shall be done without additional cost to the Owner.

B. All pipes and conduits passing through all walls or partitions shall be provided with sleeves having an internal diameter larger than the outside diameter of the pipe or insulation enclosing the pipe or conduit. Sleeves shall be Schedule 40 black steel pipe.
C. Sleeves through concrete floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with finished wall surfaces, but extending 1" above finished floors. The open sleeve space shall be packed with non-combustible materials.

D. Sleeves through non-masonry partitions shall be 22 gauge galvanized sheet steel, set flush with finished surfaces of partitions.

E. Inserts shall be preset concrete inserts with steel reinforced rods through the insert and both ends hooked over the reinforced mesh. Inserts shall be of individual type of malleable iron construction with accommodation for removable nuts and threaded rods up to ¾" diameter, permitting lateral adjustment, except as otherwise noted. Individual inserts shall be Grinnell Fig. 279 up to 5" pipe and conduit, Fig. 282, 6" and up to 8" pipe and conduit, Fig. 152 above 8" and up to 12" pipe and conduit. For figures 282 and 152, they shall come with an opening at the tip to allow reinforcing rods up to ½" diameter to be passed through the insert body. Rods shall extend a minimum of 4" on either side of the insert. Pipes larger than 12" shall be suspended from steel members only.

F. In general, all piping and conduit shall be supported from structural steel building members only or approved malleable steel inserts imbedded in concrete pours. All other loads shall be hung from steel building members. Inserts shall not be located in the same deck flute as ceiling tabs nor within 2 feet in any direction from ceiling tabs. Inserts shall not be spaced closer than 4 feet on center in all directions.

G. Where layout revisions are required, and are approved after concrete deck is poured, piping conduit 3" and smaller may be supported at Intermediate Points by Phillips' ¾" expansion bolts with lead shields, provided main supports are welded to structural steel and are not more than twenty feet on centers.

H. The Contractor shall have the option of providing 18 gauge sheet metal sleeves in lieu of Schedule 40 steel pipe.

I. Piping and conduit 3" and smaller shall be supported from existing slab by "Phillips" ¾ expansion bolts with lead shields. Piping 4" and larger shall be supported by means of 4" x 4" x ¾" clip knee angle with ¾" expansion bolt in shear and supporting rod at 90° from another bolt or using two expansion bolts per hanging post - pipes 8' and larger shall be supported from steel building members.

J. Provide sleeves for pipes passing through roofs. Sleeves passing through roofs shall be as detailed on drawings extending min. 12" above finished roof. All pipes passing through roof shall be minimum of 10" from walls or other construction to permit proper flashing. Provide counter flashing.

K. Where sleeves pass through waterproofed floors, they shall be IPS brass pipe sleeves of the required diameter, brazed at the bottom to 18" x 18", 16-ounce copper flashing for bond with waterproofing. The tops of the sleeves shall extend 1" above finished floor.

L. No ductwork, piping, conduit or equipment shall be supported from corrugated decking construction. For this area provide supplementary steel to support ductwork, piping, conduit or equipment. Supplemental steel members shall be welded to building structural steel.
M. All hangers, rods and supports shall be installed prior to construction fireproofing.

N. The required fire resistance rating of floor or floor/ceiling assemblies and walls shall be maintained where a penetration is made for electrical, mechanical, plumbing pipes, conduits, ducts and systems. Fire stopping shall be provided at openings around vents, pipes, ducts, conduits at floor levels and walls with non-combustible materials. For openings around pipes and conduits and/or sleeves, 3M product Caulk CP 25 and Putty 303 or approved equal shall be provided.

1.20 ESCUTCHEONS

A. Provide escutcheons on pipes wherever they pass through ceilings, walls, or partitions.

B. Escutcheons or pipes passing through outside walls shall be Ritter Pattern and Casting Co., № 1, solid, cast brass, flat type secured to pipe with set screw.

C. Escutcheons for pipes passing through floors shall be Ritter Pattern and Casting Co., № 36A, split-hinged, cast brass type, designed to fit pipe on one end and cover sleeve projecting through floor on the other end.

D. Escutcheons for pipes passing through interior walls, partitions, and ceilings shall be Ritter Pattern and Casting Co., № 3A, split-hinged, cast brass chromium plated type.

1.21 MANUFACTURERS' IDENTIFICATION

A. Manufacturer's nameplate, name or trademark, shall be permanently affixed to all equipment and material furnished under this Specification. Where such equipment is in a finished occupied space, the nameplate shall be in a concealed but accessible location. The nameplate of a Subcontractor or Distributor will not be acceptable.

1.22 EQUIPMENT NAMEPLATES

A. Provide for each item of equipment, including panelboards, disconnects, breakers, starters, switches, and all control devices, pumps, fans, compressors, boilers, etc., a permanently attached nameplate made of black surface, white core laminated bakelite with incised letters. Subcontractor furnishing equipment shall provide nameplate. Pneumatic, electric and mechanically actuated gauges shall have a brief, but complete description of their function. Stating the air pressure or voltage range alone is not acceptable. Nameplates shall be a minimum of 3" long by 1½" wide and shall bear the equipment name and item number (tag number) in ½" high white letters as designated in the equipment schedule. Nameplates shall be attached to their respective equipment by screws or rivets.

1.23 TAGS AND CHARTS

A. Furnish and attach to each valve as hereinafter specified, a 1½" diameter brass tag with ½" indented numerals filled with durable black compound. Tags shall be securely attached to stems of valves with wire and "S" hooks.

B. Valve charts shall consist of schematic drawings of piping layouts, showing and identifying each valve and describing the function. Upon completion of the work, one (1) copy of each
chart, sealed to rigid backboard with clear lacquer placed under glass and framed, shall be hung in a conspicuous location in the main equipment room, unless otherwise directed by the Architect. Two (2) additional unmounted copies in 8½” x 11” leather ring binders shall be delivered to the Architect. Also furnish three (3) copies of schematic flow chart with corresponding valve numbers noted on chart.

C. Provide tags for the following valves:
1. Zone control, bypass, shut-off, check and balancing valves.
2. Building and area shut-off and balancing valves.
3. Control, by-pass, shut-off, balancing and drain valves for major pieces of equipment such as boilers, domestic hot water heaters, heat exchangers, refrigeration machines, pumps, heating, ventilating and air conditioning units, cooling towers, etc.

1.24 IDENTIFICATION

A. Identification shall be in accordance with "Scheme for Identification of Piping System ANSI A13.1" and OSHA safety color regulation.

B. Markers shall be snap-on type as manufactured by Seton Nameplate Corp., New Haven, Conn. (Setmark System), Bunting Stamp Co. Inc., Pittsburgh, P.A. or approved equal. Markers shall completely encircle the pipe with a substantial overlap. No adhesive shall be used. They shall be manufactured of U.L. approved, self-extinguishing plastic. When the pipe, including insulation (if any), is larger than 4 inches diameter, markers shall be strap-on type. For piping located outdoors, all markers shall be strap-on type for all pipe diameters.

C. Provide identification for piping, ductwork and conduit for electrical work.

D. All piping and ductwork shall be labeled, whether concealed above ceilings or exposed. Labels shall be installed at intervals no greater than 15 feet (unless noted otherwise) and shall be installed after every turn or elbow. Where concealed above ceilings, a minimum of one (1) label shall occur above each room. Due to various above ceiling visual obstructions, the Engineer reserves the right to request additional labels in order to ensure visibility, at no additional cost to the Owner.

E. Pipe shall be lettered and valves tagged in accordance with the schedule below. Lettering shall be located near each valve and branch connection and at intervals of not over 40 feet (10 feet on fire lines, and at least once in each room and in each story traversed for medical gas piping) on straight runs of pipe. Provide flow arrows for all piping at each marker. Adjacent to the legend, stencil the size of the pipe, conduit or ductwork. Letter Colors are as follows: Yellow with black letters, green with white letters, blue with white letters and red with white letters.

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FASHION INSTITUTE OF TECHNOLOGY
FRED P. POMERantz ART & DESIGN CENTER
D633 SCULPTURE LAB RENOVATION

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<tr>
<td>Mixed Air</td>
<td>M.A.</td>
<td>Green</td>
<td>----</td>
</tr>
<tr>
<td>Dual Temperature Water Supply</td>
<td>Dual Temp Water Sup.</td>
<td>Green</td>
<td>D.T.W.S.</td>
</tr>
<tr>
<td>Reheat Hot Water Supply</td>
<td>Reheat HW Sup.</td>
<td>Green</td>
<td>RH.H.W.S.</td>
</tr>
<tr>
<td>Reheat Hot Water Return</td>
<td>Reheat HW Ret.</td>
<td>Green</td>
<td>RH.H.W.R.</td>
</tr>
</tbody>
</table>

F. Tanks, pumps, fans and other equipment shall be labeled to show the number, if any, and service.

G. Exposed conduits for alarm and communication systems shall be banded at intervals of not over 10 feet. Bands shall be of the following colors:
1. Fire Alarm System ................................................................................................... Red
2. Waterflow and Sprinkler Supervisory System ........................................ Red & Yellow
3. Security System ..................................................................................... Blue & Yellow
4. Clock System ........................................................................................................ Green
5. Mechanical & Electrical Supervisory System.......................................... Green & Blue
6. Telephone System.......................................................................................... Green & Yellow

H. Except where other means of identification are specified, electric cabinets, switchboards, motor control centers, transformers, system control boards, disconnecting switches, remote control switches, individual motor starters and motor control pushbutton stations shall be stenciled to show the service and number, if any, of the equipment controlled, as appropriate. Panelboards and other electrical equipment located in finished areas, such as offices, shall have the identification placed on the inside of the cabinet doors.

I. Cabinet housing emergency lighting panelboards shall have the word "EMERGENCY" stenciled in 2-inch high red letters on the outside of the cabinet, in addition to other lettering required above.

J. The bolted covers of housings for disconnecting switches or links in bus ducts between network transformers and switchboards shall be lettered to identify the equipment within.

K. Serial numbers shall be stenciled on the tanks and covers of transformers having their nameplates attached to the high voltage switch chamber covers.

L. Signs for Equipment Controlled through the BAS: For all fans, pumps and other motor driven equipment with start/stop control through the BAS provide a red surface, white core laminated
bakelite sign with incised letters, permanently mounted on the equipment indicating, “Warning. This Equipment Is Started and Stopped Automatically from the Building Automation System.”

1.25 COORDINATION OF MECHANICAL AND ELECTRICAL EQUIPMENT LOCATIONS

A. The space equal to the width and depth plus 6” on either side of the electrical equipment and extending to a height of 6 feet above the equipment or the structural ceiling, whichever is lower, shall be dedicated to the electrical installation and shall not contain piping ducts or other equipment foreign to the electrical installation. Electrical equipment shall include switchboards, panelboards and motor control centers.

B. Examine the drawings, and in cooperation with the Electrical Work confirm the final location of all electrical equipment to be installed in the vicinity of piping and ductwork. Plan and arrange all overhead piping no closer than three feet, and ductwork no closer than one foot from a vertical line to electric switchboards, panelboards, motor control centers or similar equipment.

C. Where the installation of piping or ductwork does not comply with the requirements of foregoing paragraphs, where feasible, the piping and ductwork shall be relocated. Installation of a barrier between piping and ductwork and electrical equipment below will be considered if located more than six feet above the electrical equipment. Refer to NEC Article 110. If piping ductwork and foreign equipment cannot be located outside of the space dedicated to electrical installation, a drip pan as described below can be considered to protect the electrical equipment from condensation, leaks or breaks, but shall be approved by the Engineer after the Contractor has demonstrated that piping, ductwork and/or equipment cannot be installed to avoid this space.

1.26 TOOLS

A. All special tools for proper operation and maintenance of the equipment shall be delivered to the Owner's representative and a receipt requested for same at no additional cost to the Owner.

1.27 QUIET OPERATION

A. All equipment and material shall operate under all conditions of load without any sound or vibration which in the opinion of the Architect is objectionable. Where sound or vibration conditions arise which are considered objectionable by the Architect, eliminate same in a manner reviewed by the Architect.

1.28 RUBBISH REMOVAL

A. See to it that the project is at all times maintained free of all rubbish, rubble, waste material, packaging materials, etc. accumulating as a result of his work. Assume responsibility for the cleaning up of packaging removed from materials and equipment furnished by other trades for the installation. Note that final acceptance of the work is contingent upon the project being free of all excess and waste materials resulting from the work.

1.29 CLEANING, PIPING, DUCTS AND EQUIPMENT

A. Clean all piping, ducts, and equipment of all foreign substances inside and out before being placed in operation.
B. If any part of a system should be stopped by foreign matter after being placed in operation, the system shall be disconnected, cleaned, and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of removing obstructions shall be repaired when the system is reconnected at no additional cost to the Owner.

C. During construction, properly cap all pipes and equipment nozzles so as to prevent the entrance of sand, dirt, etc.

1.30 DELIVERY OF MATERIAL

A. Deliver the material and store same in spaces indicated by the Architect and assume full responsibility for damage to structure caused by any overloading of the material.

1.31 CUTTING AND PATCHING (IN EXISTING CONSTRUCTION)

A. All cutting and patching shall be done under another Section. Furnish the sizes and locations of all chases and openings required for the installation for his work before the walls, floors and partitions are built.

B. As a general rule, chases, shafts and wall openings as shown on the Drawings will be provided for most of the ducts and pipings, but promptly arrange with the Construction Supervisor for additional openings should any be required for the work.

C. Provide the labor and materials for all work included under the Contract or Subcontract in ample time and sufficient quantities so that all of the work of the Contract or Subcontract may be installed in proper sequence to avoid unnecessary cutting of the floors and walls.

D. Any cutting and patching required due to the failure to comply with the above provisions, shall be done at no extra cost to Owner. Such cutting and patching shall be done under Division One, as approved by the Architect.

E. Where existing piping or ductwork insulation are damaged by the requirements of the work, replace all damaged insulation to match existing.

F. Refer to Paragraph: "Sleeves, Inserts and Anchor Bolts" for additional requirements.

1.32 ALTERATIONS

A. When new work and alterations render equipment, piping and ductwork useless, such equipment, piping and ductwork when exposed to view, shall be removed and connections thereof to lines or ducts remaining shall be properly capped or plugged and left in construction. If construction, such as hung ceiling, furred beam, chase, etc., is opened up and removed during the course of the construction, the useless pipe and ducts therein shall be treated as though exposed to view. When required to accommodate new work, useless piping and ductwork concealed in construction shall be treated as though exposed to view.

B. When existing piping and duct systems, at points of connection to new work or in rerouting are found defective, such defective portions shall be removed and replaced with new materials without cost to the Owner.
C. Provide temporary supports where required.

D. Where alterations reveal piping, ductwork, conduit circuits, wiring, and accessories that must necessarily remain in service, same shall be rerouted, replaced or altered as required to make same completely concealed in the new work at no additional cost to the Owner.

E. Where existing piping or ductwork insulation is damaged by the requirements of the work, replace all damaged insulation to match existing.

F. Cutting in existing building shall be done by each Contractor as reviewed by the Architect. Rough patching shall be done by each Contractor. Finish patching, ceiling construction removal, new ceiling in existing building will be done under another Section.

1.33 PAINTING

A. Painting Schedule
1. No on-site painting is required on the following items unless specifically indicated otherwise:
   a. Stainless steel or monel sheet metal.
   b. Stainless steel or monel piping.
   c. Piping or ductwork to be insulated.
   d. Insulation on piping or ductwork in unfinished spaces or concealed.
   e. Insulated piping covered with stainless steel, aluminum or all service jacketing, unless otherwise specified.
   f. Insulated piping in walk-in and non-walk-in tunnels.
   g. Mechanical equipment with a factory applied baked-on enamel finish, not specified to be insulated or provided with an enameled steel insulated jacket.
   h. Insulated equipment or smoke stacks specified or noted on the Drawings to be covered with stainless steel or aluminum sheet metal jacketing.
   i. Factory fabricated multi-wall metal smoke flue piping.
   j. Concealed piping.
2. Paint the following:
   a. Uninsulated Black Steel Piping:
      1) Exposed in Finished Rooms or Finished Spaces: 1 coat of primer and 2 coats of latex semi-gloss enamel.
      2) Exposed in Unfinished Rooms, or Unfinished Spaces, or in Pipe Shafts: 1 coat of primer and 2 coats of finish.
      3) Exposed Exterior to a Building: 1 coat of primer and 2 coats of exterior acrylic latex gloss enamel.
   b. Uninsulated Galvanized, Cast Iron, Brass or Copper Piping:
      1) Exposed in Finished Rooms or Finished Spaces: 1 coat of primer and 2 coats of latex semi-gloss enamel.
      2) Exposed Exterior to a Building: 1 coat of primer and 2 coats of exterior acrylic latex gloss enamel.
      3) Exposed in Unfinished Rooms or Unfinished Spaces: 1 coat of primer and 2 coats of finish.
   c. Piping in floor trenches after fabrication: primer and finish.
   d. Uninsulated Mechanical Equipment:

e. Vessels, Tanks, and Like Equipment Specified to be Insulated: 1 coat of corrosion resistant paint, prior to the application of insulation.

f. Uninsulated Exposed Iron and Steel Surfaces of Boilers, Including the Steel Casing, Buck Stays, Boiler Fronts, Castings, Smoke Pipes, Breeching and the Exposed Surfaces of all Other Iron or Steel Installed in Conjunction with Boiler Work: 1 coat of primer and 2 coats of heat resistant enamel.

g. Hangers, Supports and Accessories:
   1) Exposed: Paint to match adjacent piping, pipe insulation or ductwork insulation.
   2) All black steel or iron pipe hangers, rods, inserts, brackets and accessories for supporting piping systems and duct systems: 1 coat of primer and 2 coats of latex semi-gloss enamel. Paint black steel hanger rods, threaded on the job site, with a primer immediately after installation.
   3) Metal Fabrications in Finished Spaces: Paint over shop coat with 2 coats of alkyd gloss enamel.

h. Sheet Metal Work:
   1) Exposed Black Iron, Galvanized Iron, and Aluminum, including Hangers for Insulated and Uninsulated Ductwork, in Finished Rooms, Finished Spaces or Exterior to a Building: 1 coat of primer and 2 coats of latex semi-gloss enamel.
   2) Jacketing on Exposed Insulated Ductwork in Finished Rooms and Finished Spaces: 2 coats of latex semi-gloss enamel. No primer required.

i. Uninsulated Exposed Valves, Flanges, Unions and Irregular Surfaces in Piping Systems Installed in Finished Rooms or Finished Spaces: 1 coat of primer and 1 coat of black heat resistant enamel.

j. Convector enclosures shall be painted at the factory as specified in Section 15835: Conectors.

B. The inside of all ductwork where visible through openings shall be painted with two prime coats of flat black paint.

C. Nameplates on all equipment shall be cleaned and left free of paint. Where equipment is to be painted, the Contractor shall carefully mask all equipment nameplates and data tags prior to application of paint. Such masking shall be removed after paint has dried.

D. All lead bends and lead safes and flashing shall be painted with two coats of waterproof black asphaltum varnish.

1.34 LUBRICATION

A. Assume responsibility that all rotating equipment is properly lubricated as soon as it is connected by the Electrical Subcontractor before operation of this equipment is started. Assume responsibility for any damage to any equipment that is turned on without previously having been oiled or greased when connected up.

1.35 TESTS
A. All piping, wiring, and equipment shall be tested as specified under the various sections of the work. Labor, materials, instruments and power required for testing shall be furnished under various Sections of the Specifications.

B. Tests shall be performed satisfaction of the Architect. The Architect will be present at such test, when he deems necessary and such other parties as may have legal jurisdiction.

C. Pressure tests shall be applied to piping only before connection of equipment and installation of insulation. In no case shall piping, equipment, or accessories be subjected to pressure exceeding their rating.

D. All defective work shall be promptly repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the review of the Architect.

E. Any damages resulting from tests shall be repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architect.

F. The duration of tests shall be as determined by all authorities having jurisdiction, but in no case less than the time prescribed in each Section of the Specifications.

G. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems, and their controls. Whenever the equipment or system under test is interrelated with and depends upon the operation of other equipment, systems and controls for proper operation, functioning, and performance, the latter shall be operated simultaneously with the equipment or system being tested.

H. The electrical work shall include providing any assistance (such as removal of switchboard and panelboard trims and covers, pull and junction box covers, etc.) deemed necessary by the Architect to check compliance with the Drawings and Specifications.

1.36 OPERATING INSTRUCTIONS

A. Two months prior to the completion of all work and the final inspection of the installation by the Owner, five (5) copies of a complete Instruction Manual, bound in booklet form and suitably indexed, shall be submitted to the Architect for review. All written material contained in the manual shall be typewritten or printed.

B. The Manual shall contain the following items:

<table>
<thead>
<tr>
<th>Table of Contents (Plumbing, HVAC and Electrical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. Description of Systems</td>
</tr>
<tr>
<td>1. Complete schematic drawings of all systems.</td>
</tr>
<tr>
<td>2. Functional and sequential description of all systems.</td>
</tr>
<tr>
<td>3. Relationship of system where applicable to the supervisory data system.</td>
</tr>
</tbody>
</table>

III. Systems Operation
1. Start-up procedures.
2. Shut-down procedures.
3. Reset and adjustment and balancing procedures.
4. Seasonal operation.
5. All posted instruction charts.

IV. Maintenance

1. Cleaning and replacement - lines, components, filters, strainers, ducts, fans, etc.
2. Lubrication.
3. Charging and filling.
4. Purging and draining.
5. Systems trouble shooting charts.
6. Instruments checking and calibration.
7. Procedures for checking out functions with remote (Supervisory Data Console) indication and control.
8. Recommended list of spare parts.

V. Listing of Manufacturers

VI. Manufacturer's Data (Where multiple model, type and size listings are included, clearly and conspicuously indicate those that are pertinent to this installation).

1. Description - Literature, drawings, illustrations, certified performance charts, technical data, etc.
2. Operation.
3. Maintenance - including complete trouble-shooting charts.
4. Parts List.
5. Names, addresses and telephone numbers of local recommended repair and service companies.
7. Model No. and Serial No. of all equipment.

1.37 INSTRUCTION OF OWNER'S PERSONNEL

A. After completion of all work and all tests and at such time as designated by the Architect, provide the necessary skilled personnel to operate the entire installation for a period of two (2) consecutive days eight hours each.

B. During the operating period, fully instruct the Owner's representative in the complete operation, adjustment and maintenance of the entire installation.

1.38 GUARANTEE

A. The Contractor guarantees by his acceptance of the Contract that all work installed will be free from any and all defects and that all apparatus will develop capacities and characteristics specified, and that if during a period of one year from date of completion and acceptance of work, one (1) entire heating and cooling system or eighteen (18) months from ship whichever is later, any such defects in workmanship, material or performance. He shall immediately replace, repair, or otherwise correct the defect or deficiency without cost to the Owner within a
reasonable time. Notify the Architect in writing of the time required to do work. For heating systems the guarantee period must include one continuous heating season from November 1st to April 1st. For cooling systems the guarantee period must include one continuous cooling season from May 1st to October 1st.

B. Replace or repair to the satisfaction of the Owner any and all damage done to the building or its contents or to the work of other trades in consequence of work performed in fulfilling guarantee.

C. This Article is general in nature and will not waive stipulations of other claims which specify guarantee periods in excess of one (1) year.

D. In the event default on this Guarantee, the Owner may have such work done as required & charge the cost to the Contractor.

E. The date of acceptance shall be the date of final payment by the Owner or notice of acceptance by the Owner, whichever is later.

1.39 OPERATION PRIOR TO COMPLETION

A. The Owner may require operation of parts or all of the installation for the beneficial occupancy prior to final completion and acceptance of the building.

B. The operation shall not be construed to mean acceptance of the work by the Engineer for the Owner. The Owner will furnish supervisory personnel to direct operation of the entire system and the Contractor shall continue to assume this responsibility until final acceptance.

1.40 INSTALLATION OF MOTORS AND CONTROL EQUIPMENT

A. Motor Control Centers (MCC's) shall be furnished by the HVAC Contractor and shall be installed by the Electrical Contractor. The Electrical Contractor shall set and fully install the MCC on the concrete pad. Concrete pads shall be provided by the HVAC Contractor.

B. The Electrical Contractor shall furnish and install power wiring for all electrical devices, individual motor starters and MCC's, furnished to him at the job site by other trades.

C. The HVAC Contractor shall provide all wiring for the Automatic Temperature Controls, Combustion Control, Burner and Boiler Control, and condenser water treatment controls, except as otherwise specified herein. This shall include low voltage wiring and 120 VAC power wiring unless electrical drawings show 120 VAC feed for the ATC panels.

D. The Electrical Contractor shall, except where otherwise noted, provide wiring for all Plumbing and Sprinkler Control and Alarm Systems. The Plumbing Contractor shall provide all devices in connection with same.

E. The Electrical Contractor shall provide all low voltage wiring and 120 VAC power to all auto smoke and combination fire/smoke dampers, which shall be controlled from the Fire Alarm Panel.
F. For single phase motors which are not interlocked with other motors and which have
temperature control or motor control devices in the power circuit, furnishing of control devices,
installation and wiring shall be by the Electrical Contractor.

G. For all HVAC 3-phase motors or HVAC equipment, temperature control wiring, motor control
wiring and associated interlocks shall be provided by the HVAC Contractor, including the
installation of all control devices. For all plumbing and sprinkler 3-phase motors, equipment
control wiring, motor control wiring and associated interlocks shall be provided by the electrical
Contractor, including the installation of all control devices.

H. Whether or not shown on the drawings, the Electrical Contractor shall furnish and install a local
disconnect switch at each motor which is not in sight from the controller location.

I. Electrically operated equipment supplied by other trades, which are to be installed and wired by
the Electrical Contractor, shall be delivered with detailed instructions for their installation and
wiring in sufficient time and proper sequence to meet the work schedule.

J. Each contractor shall furnish all electrical motors, starters and other motor control devices for
motor driven equipment required for the work. In his work, the Electrical Contractor shall
provide the code required disconnect switches for all motors, except where otherwise noted.
The setting of all motors, required for mechanical equipment, including unmounted motors,
shall be done as part of the mechanical work.

K. If a motor is replaced (even with the same horsepower) a new starter shall be provided for that
motor.

L. Equipment which includes a group of electrical control devices mounted in a single enclosure or
on a common base with equipment, shall be supplied completely wired as a unit with terminal
boxes or leads ready for external wiring.

M. All electrical items furnished and/or installed as part of the mechanical work shall conform to
NEMA Standards, to the requirements of the National Fire Protection Association, and to the
requirements of any local authority having jurisdiction. Any field modifications required to
insure such conformance shall be included as part of the mechanical work.

N. The furnishing of floor mounted motor starting equipment shall include the purchase and
delivery of channel sills for mounting.

O. Whether or not shown on the drawings, the Electrical Contractor shall furnish and install a local
disconnect switch at each motor which is not in sight from the controller location.

P. The supplying of any and all "field instruction" diagrams deemed necessary by the Architect for
the complete delineation of electrical wiring for mechanical equipment shall be included as part
of the mechanical work.

Q. The drawings describing the electrical or the mechanical work may include explanatory wiring
diagrams indicating the function intended for the motor control circuits of certain motors. The
"field instructions" wiring diagrams required as part of the mechanical work shall conform to
these intended functions.
R. Electric power required for control circuits shall be taken by the HVAC Contractor from the electric circuits in the junction boxes left by the Electrical Contractor for ATC use as indicated on the electrical drawings. Where junction boxes are not indicated on the electrical drawings, the HVAC Contractor shall run power wiring to the nearest electrical panel with spare circuits and provide required circuit breaker. The ATC Contractor shall provide and wire all required transformers for the ATC system.

S. The HVAC Contractor shall coordinate the control systems with unit ventilator and VAV terminal box manufacturers. The HVAC Contractor shall provide all necessary control equipment which is not provided by the unit manufacturer to complete the sequence of operation as specified herein. The HVAC Contractor shall provide all field wiring.

1.41 SEMI-FINAL AND FINAL SITE VISITS FOR OBSERVATION

A. As the project approaches completion, the Engineer and Architect, at their discretion shall determine a period of time in which they shall perform a Semi-Final Site Visit to observe the Mechanical and Electrical installation. At the conclusion of this Semi-Final Site Visit, a Semi-Final Punchlist shall be issued to the appropriate Contractor for the deficiencies in the work of his trade. Complete all work and perform all corrective measures as required by the Semi-Final Punchlist. After this corrective and completion work has been accomplished, in writing, advise the Architect and the Engineer that every item on the Semi-Final Punchlist has been completed. After the Architect and Engineer make a Final Site Visit to observe the Mechanical and Electrical installation and make a Punchlist, a similar letter of Compliance shall be forwarded through the appropriate channels.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.01 INSTALLATION OF EQUIPMENT

A. The Contractor shall be responsible for the installation of all equipment in accordance with the Manufacturer’s Installation/Operation & Maintenance Manuals and instructions. If other requirements of this Specification contradict what is stated in the Manufacturer’s instructions, the matter shall be brought to the attention of the Architect and Engineer for clarification. Any and all of the Manufacturer’s requirements for utilities (electrical power and control wiring, piped water, drain, gas, fuel oil, steam, condensate, etc.), ducted supply or exhaust air, mounting and support shall be provided by the Contractor, regardless of how, or whether or not stated elsewhere in the Contract/Bid Documents.

END OF SECTION 01 31 46
SECTION 01 33 00 - SUBMITTALS

PART 1 - GENERAL

1.1 DEFINITIONS

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

1.2 DEVIATIONS FROM REQUIREMENTS OF THE CONTRACT DOCUMENTS

A. Deviations from the requirements of the Contract Documents will not be allowed unless a request for deviation is made in writing prior to or at the time of submission and the specific deviation is approved by the Owner or Architect. The submission of a deviation shall be done in a timely manner according to the schedule of submittals to allow the Architect sufficient time for review.

1.3 “OR EQUAL” TO BRAND NAME PRODUCTS

A. Whenever a product is specified by brand name, a comparable brand, equal to that named, may be submitted for approval subject to:
   1. The contractor shall bear the burden of proving that the proposed product is equal to the specified product. The submission of an “or equal” shall be done in a timely manner to allow sufficient time to review the proposed product by the Architect.
   2. Whenever a color or pattern is indicated by a specific manufacturer’s name or number, the intent is to communicate the required color or pattern of the material. Other manufacturers’ comparable colors or patterns may be submitted for approval as equal.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Identify all submittals by project title and number. Include Contractor’s name, date, and revision date. On shop drawings, product data and samples, also include the name of the supplier and subcontractor (if any), and applicable specification section number. Stamp each submittal and initial or sign the stamp to certify review and approval of submittal.

B. Assemble submittals in accordance with the requirements in the individual sections of the Specifications and as required by this section. It is the Contractor's responsibility to review and verify that all information required for each submittal is included in the submittal package. Errors or
omissions found by the Contractor are to be corrected prior to the submission of the submittal package for approval. Incomplete submittal packages that have been submitted for review and approval will be returned.

1. It is the Contractor's responsibility to verify that portions of the submittal package to be provided by a subcontractor (or supplier) are complete, as well as portions of the submittal package being provided directly by the Contractor.

2. Do not combine the submittals of more than one specification section with submittals required by other specification sections unless specifically stated in the contract specifications.

C. If a submittal is based on, or the result of an RFI, a change order or field order to the Contract documents, include copies of the applicable RFI change order or field order with the submittal.

1.5 COORDINATION DRAWINGS

A. Provide coordination drawings showing scope of all work. Coordination drawings to indicate any conflicts between services or ceiling heights as indicated on Architectural Drawings or otherwise specified.

1.6 SHOP DRAWINGS

A. Provide shop drawings in the format required by the specifications. Show the information, dimensions, connections and other details necessary to insure that the shop drawings accurately interpret the Contract Documents. Show adjoining construction in such detail as required indicating proper connections. Where adjoining connected construction requires shop drawings or product data, submit such information for approval at the same time so that connections can be accurately checked.

1. Submit 4 copies of each shop drawing required by the Specifications.

B. Have shop drawings prepared by a qualified detailer. Shop drawings shall be neatly drawn and clearly legible. Machine duplicated copies of Construction Drawings will not be accepted as shop drawings. Architect and Engineers will not provide AutoCAD backgrounds or drawings.

1. Where shop drawings are indicated to be drawn to scale:
   a. Use scale normally found on an “Architect” scale.
   b. Written Scale: Clearly label scales being used on each drawing and/or on each detail on the drawing.
       1) Examples: $1/8“ = 1’-0”$
   c. Graphic Scale: Adjacent to each Written Scale, provide a graphic scale delineating the scale being used. Graphic scale shall be divided into measuring units relating to the accuracy required for the drawing or details.
d. Clearly dimension key elements of the drawing or detail.

2. When the drawing sheet is printed full size, the minimum text size shall be 1/8" (3.2 mm) for hand drafting and 3/32" (2.5 mm) for CADD drawings.

C. The shop drawings will be reviewed and 2 stamped copies returned. If returned copies are stamped “DISAPPROVED” or “REVISE AND RESUBMIT”, promptly resubmit 4 copies of shop drawings meeting Contract requirements.

D. Contractor is responsible for keeping one record set of all shop drawings on the job site, no matter the stamp.

1.7 PRODUCT DATA

A. Provide product data in the format required by the specifications. Modify product data by deleting information that is not applicable to the project or by marking the product data to identify pertinent products. Supplement standard information, if necessary, to provide additional information applicable to project.

1. Submit 4 copies of product data as required by the Specifications.

B. The product data will be reviewed and 3 stamped copies returned. If returned copies are stamped “DISAPPROVED” or “REVISE AND RESUBMIT”, promptly resubmit 4 copies of product data meeting Contract requirements.

C. Contractor is responsible for keeping one record set of product data on the job site, no matter the stamp.

1.8 QUALITY ASSURANCE

A. Provide quality assurance information in the format required by the specifications, including supporting documentation as required.

1. Submit 4 copies of quality assurance information as required by the Specifications.

B. The quality assurance information will be reviewed and 3 stamped copies returned. If returned copies are stamped “DISAPPROVED” or “RESUBMIT FOR CORRECTION”, promptly resubmit 6 copies of quality assurance information meeting Contract requirements.

1.9 SAMPLES

A. Submit 2 (unless a different number is specified) of each sample required by the Specifications.

B. One sample will become the property of the Owner when submitted and will not be incorporated in the Work unless specifically stated otherwise. One sample will be returned approved or rejected to the contractor.
1.10 REVIEW OF SUBMITTALS

A. Items submitted for review will be reviewed for compliance with the contract documents, based upon the information submitted. The items will be acted upon with the following dispositions:

1. Approved (or No Exception Taken): Where the submittal is marked “Approved”, the work covered by the submittal may proceed provided it complies with the contract documents. Final acceptance will depend on that compliance.

2. Approved as Noted (or Furnish as Noted): Where the submittal is marked “Approved as Noted”, the work covered by the submittal may proceed provided it complies with the review comments noted on the submittal and the contract documents. Final acceptance will depend on that compliance.

3. Revise and Resubmit: Where the submittal is marked “Revise and Resubmit”, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or other activity for the item submitted. Revise or prepare a new submittal according to the review comments noted on the submittal and meeting the contract documents.

4. Disapproved (or Rejected): Where the submittal is marked “Disapproved”, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or other activity for the item submitted. Prepare a new submittal according to the review comments noted on the submittal and meeting the contract documents.

1.11 SCHEDULES AND RECORDS

A. Submit the following Schedules and Records information not later than 7 days after approval of the Contract unless an earlier submission is required to properly schedule or progress the Work.

1. SCHEDULE OF SUBMITTALS: On the Schedule of Submittals forms, indicate in the spaces following each item, the date the item will be submitted, the date approval is required, and the date delivery of the material or equipment is necessary for timely completion of the Work in accordance with the Project Schedule. The date entered for submittal of each item is the last day a deviation will be considered. Deliver the SCHEDULE OF SUBMITTALS to the Architect and Owner.

B. Warrantees: Unless specified elsewhere contractor shall warrantee all work for (1) one year.

END OF SECTION 01 33 00

SUBMITTALS 01 33 00 - 4
PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS
A. Work under this section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this section as shown on the drawings, as specified herein, and/or as specified by job conditions.

1.2 DESCRIPTION OF WORK
A. Provide materials, labor, equipment and services to complete cutting and patching as specified herein and as indicated on the Drawings.

1.3 RELATED WORK SHOWN ELSEWHERE
A. Selective Removals and Demolition - Section 02 41 13

1.4 QUALITY ASSURANCES
A. Codes and Regulations
   1. Work specified herein shall conform to all applicable State and Local codes and regulations having jurisdiction.

1.5 SUBMITTALS
A. Product Literature
   1. Submit manufacturers’ products literature, catalog cuts and data sheets for all products used in patching.

1.6 DELIVERY, STORAGE AND HANDLING
A. Deliver materials to the site, ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to approved samples.
B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
1.7 ENVIRONMENTAL REQUIREMENTS

A. Maintain a uniform temperature between 55 and 70 degrees F within the work area.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Match the appearance and performance of existing corresponding materials as closely as practicable, unless otherwise indicated.

PART 3 – EXECUTION

3.1 MANUFACTURERS

A. Do not disturb any existing structure, piping, apparatus, or other construction unless required by the Contract.
B. Cut and alter existing materials as required to perform the Work. Limit cutting to the smallest amount necessary. Core drill round holes and saw-cut other openings where possible.
C. Remove existing construction as required to install and connect the Work to adjacent construction in an approved manner. Remove materials and equipment superseded by the Work unless specifically indicated otherwise.
D. Provide temporary supports necessary to prevent settlement or other damage to existing construction which is to remain.
E. Perform the cutting, drilling, and removals in a manner which will prevent damage to adjoining construction which is to remain.
F. Prior to any cutting, drilling, or removal, investigate both sides of the surface involved.
G. Determine the exact location of all structural members. Do not cut, drill, or remove structural members such as joists, beams, or columns supporting construction that is to remain unless expressly required by the Work. If unforeseen obstructions are encountered, take all precautions necessary to prevent damage and obtain instructions from the FIT Representative/Architect before proceeding with the Work.
H. If existing remaining items are within the damaged area, these items shall be removed and carefully stored until they can be reinstalled.

3.2 PATCHING

A. Patch existing construction and finishes defaced, damaged, or left incomplete due to alterations and removals. Patching, except as otherwise indicated, shall be limited to the areas which have been cut or altered.
B. Prepare existing surfaces properly to receive and, where required, bond with the
Work.

C. Unless otherwise indicated, provide new materials to match the appearance and performance of existing corresponding materials as closely as practicable.

D. Paint patched areas and surfaces which will remain exposed by removals to match existing adjacent surfaces as closely as practicable using same type of paint. Painting, except as otherwise indicated, shall be limited to the areas which have been patched.

3.3 REINSTALLATION

A. Where reinstallation of existing, remaining items removed during cutting is required, reinstall them to a condition equal to or better than their condition before removal.

END OF SECTION 01 73 29
PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes requirements for Construction Waste Management (CWM), with criteria for recycling and/or salvaging demolition and construction waste generated during the project. A Construction Waste Management Plan shall be developed for approval by the Facilities Representative. The Plan shall be implemented throughout the duration of the project, and shall be documented in accordance with the SUBMITTALS Article below.

B. Each contract shall supply the means for recycling job site waste. Locations for removal bins or dumpsters shall be coordinated with Facilities Representative. Following contract award, the Contractors may elect a single entity to act as the construction waste manager.

1.2 PERFORMANCE REQUIREMENTS

A. The General Contractor shall prepare and submit a Construction Waste Management Plan (CWM) to the Facilities Representative for approval. The CWM Plan shall outline the provisions to be implemented to recycle and salvage demolition and construction waste generated during the project.

B. Upon approval of the CWM Plan by the Facilities Representative, it shall be implemented throughout the duration of the project, and documented in accordance with the SUBMITTALS Article below.

C. The Construction Waste Management Plan shall include, but not be limited to, the following components:

1. Listing of Targeted Materials: Develop a list of the waste materials from the Project that will be targeted for reuse, salvage, or recycling. The following materials shall be accounted for (materials that will not be recycled shall be indicated as such):

   a. Cardboard, paper, packaging.
   b. Clean dimensional wood, palette wood.
   c. Beverage containers.
   d. Metals from banding, stud trim, ductwork, piping, rebar, windows, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   e. Gypsum board.
   f. Paint.
g. Glass/Mirrors.

h. Plastics.

i. Woods.

j. Tile

2. Information: Provide the name of the landfill(s) where trash will be disposed of and the applicable landfill tipping fee(s).

3. Sorting Method: Provide a description of the proposed means of sorting and transporting the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site for off-site sorting).

4. Packaging Waste: Provide an estimate of packaging materials generated, and note whether suppliers will eliminate or take back packaging.

5. Field Conditions: Include provisions in the Construction Waste Management Plan for addressing conditions in the field that do not adhere to the CWM Plan, including provisions to implement a stop work order, or to rectify non-compliant conditions.

6. Recycling facilities: Provide the name of the recycling facilities(s) where materials will be sent for recycling, how it will be recycled, and the applicable fee(s).

7. Additional Information: Include any additional information deemed relevant to describe the scope and intent of the CWM Plan to the Facilities Representative.

8. Re-Used materials/Equipment: Materials or equipment to be removed from the site or turned over to the College which are classified as recycled materials shall be documented. Documentation shall include the materials turned over, weight or quantity of materials/equipment and a letter on company letterhead indicating the intended use of items.

9. Subcontractor Requirements: Construction Waste Management and recycling requirements shall be incorporated into all Subcontractor’s contracts.

1.3 SUBMITTALS

A. Submittal Requirements:

1. A copy of the Construction Waste Management Plan, as defined in the PERFORMANCE REQUIREMENTS Article above.

2. In conjunction with payment applications, contractors shall submit a monthly Waste Management submission. This submission shall include waste receipts for the payment period and a completed Waste Management Form for the same payment period.

3. Calculations and supporting documentation to demonstrate end-of-project recycling rates meeting the requirements of the Construction
Waste Management Plan. The process for recording and assembling documentation shall be as follows:

a. Record and document the total weight (in tons) of all demolition and construction waste materials sent to the landfill. Monthly Waste Management Reporting Forms (sample included at the end of this Section identified as Exhibit “A”) shall be used as the basis for determining the total amount of waste landfilled for the project. The monthly reporting forms shall specify:

1) The number of dumpsters or other containers sent to the landfill for that month.
2) The volume (in cubic yards) of each dumpster or container sent to the landfill for that month.
3) The type of waste contained in each dumpster or container.
4) The weight of the waste in each dumpster or container. If the weight of the waste is not directly measured for each dumpster or container, the following Solid Waste Conversion Factors shall be used to convert the volume of waste to weight:

<table>
<thead>
<tr>
<th>Solid Weight Conversion Factors</th>
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<tbody>
<tr>
<td>Mixed Waste</td>
</tr>
<tr>
<td>350 lbs/cubic yard</td>
</tr>
<tr>
<td>Wood</td>
</tr>
<tr>
<td>300 lbs/cubic yard</td>
</tr>
<tr>
<td>Cardboard</td>
</tr>
<tr>
<td>100 lbs/cubic yard</td>
</tr>
<tr>
<td>Gypsum Board</td>
</tr>
<tr>
<td>500 lbs/cubic yard</td>
</tr>
<tr>
<td>Rubble</td>
</tr>
<tr>
<td>1,400 lbs/cubic yard</td>
</tr>
<tr>
<td>Steel</td>
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<tr>
<td>1,000 lbs/cubic yard</td>
</tr>
</tbody>
</table>

5) Identification of the landfill. In addition, provide the name of the landfill that will be accepting the materials. Receipts or other proof of facility reception of materials is required.

b. Record and document the total weight (in tons) of all demolition and construction waste materials recycled or salvaged. Monthly Waste Management Reporting Forms shall be used as the basis for determining the total amount of waste recycled or salvaged for the project. The monthly reporting forms shall specify:

1) The number of dumpsters or other containers of recycled or salvaged materials for that month.
2) The volume (in cubic yards) of each dumpster or container of recycled or salvaged materials for that month.
3) The type of recycled or salvaged material contained in each dumpster or container.
4) The weight of the recycled or salvaged material in each dumpster or container. If the weight of the
material is not directly measured for each dumpster or container, the Solid Waste Conversion Factors listed for landfill waste above shall be used, where applicable, to convert the volume of material to weight. For materials not contained in the Solid Waste Conversion Factors above propose a conversion factor for review by the Director’s Representative.

5) In addition, provide the name of the receiving facilities/companies that will be purchasing or accepting the recycled or salvaged materials. Receipts or other proof of facility reception of materials is required.

6) For materials separated for recycling off-site, establish a method for tracking the weight of the recycled material. The method shall be included in the CWM Plan for the Director’s Representative review and approval.

c. Calculate the end-of-project recycling rate percentage by dividing the recycled and salvaged waste (in tons) by the total waste generated (recycled, salvaged, and landfilled waste – also in tons), and multiplying by 100.

d. For materials turned over to others for reuse, provide documentation on company letterhead indicating the material(s), the quantity (either by weight or units), the date and the intended reuse of the product.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 IMPLEMENTATION

A. The General Contractor shall be responsible for the provision of containers and the removal of all waste, non-returned surplus materials, and rubbish from the site in accordance with the Waste Management Plan. The General Contractor shall oversee and document the results of the Plan. The Sub-Contractors shall be responsible for collecting, sorting, and depositing in designated areas, their waste, non-returned surplus materials, and rubbish, as per the Waste Management Plan.

B. Instruction. The General Contractor shall provide on-site instruction of appropriate separation, handling and recycling, salvage, reuse and return methods to be used by all parties in appropriate stages of the Project.

C. Separation Facilities: The General Contractor shall lay out a specific area(s) to facilitate separation of materials for potential recycling, salvage,
reuse and return. Each potential material shall be collected and stored to avoid being mixed with other materials. Recycling and waste bin areas are to be kept neat and clean, and clearly marked.

3.2 MEETINGS

A. Conduct Construction Waste Management meetings. Meetings shall include Subcontractors affected by the CWM Plan. At a minimum, waste management goals and issues shall be discussed at the following meetings:
1. Pre-bid meeting.
2. Pre-construction meeting.
3. Regular job-site meetings.

3.3 MONTHLY WASTE MANAGEMENT REPORTING FORMS

A. Monthly Waste Management Reporting Forms, as required in the SUBMITTALS Article above, shall be submitted to the Facilities Representative and Architect for review throughout the duration of the project.

END OF SECTION 01 74 19
**CONSTRUCTION WASTE MANAGEMENT**

**01 74 19 - 6**

**Project Name** (Exhibit “A”)

**CONTRACTOR C&D WASTE MANAGEMENT FORM**

For Waste Generated On-Site

Company: ____________________________________

Contact: ____________________________________

Phone: ____________________________________

<table>
<thead>
<tr>
<th>Material Description (Include packaging waste if applicable)</th>
<th>Total Weight</th>
<th>% Reused on-site</th>
<th>% Recycled off-site</th>
<th>% Sent to landfill</th>
<th>Material Recipient</th>
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</table>

**Recycled Material:** Material that would otherwise be destined for landfill but is diverted from the waste stream, reintroduced as material feedstock and reprocessed into new end products.

**Reused Material:** Materials that can be reused in their original form without any reprocessing.
SECTION 01 77 00
CONTRACT CLOSEOUT
REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contract Documents, including but not limited to, the Drawings and Individual Specification Sections and Notice of Substantial Completion (NOSC) Form, apply to this section.

1.2 SUMMARY

A. Section includes administrative requirements for preparation and submission of final Contract Closeout Documents, including, but not limited to, the following:

1. Contract Closeout Conference
2. Notice of Substantial Completion (NOSC) Requirements
   a. List of Incomplete Work Items
   b. Contract Turnover Documents
      1) As-built Drawings
      2) As-built Specifications
      3) As-built Schedule
      4) Permits, Licenses and Certificates
      5) Hazardous Wastes Documents
   c. General Guarantee
   d. Operation and Maintenance Manuals
3. Contract Closeout
4. Final Cleaning

B. Related Sections:

1. Section 013300 – Submittals

1.3 CONTRACT CLOSEOUT CONFERENCE

A. Contract Closeout Conference: The Owner will schedule and conduct a Contract closeout conference, at a time convenient to the Owner and Design Professional, but no later than (60) continuous calendar days prior to the scheduled inspection date for Substantial Completion.
1. The Owner and/or the Owners Representative will conduct the conference to review requirements and responsibilities related to Contract closeout.

2. Attendees: Representatives of the Owner, testing agency, commissioning authority (if applicable), Design Professional, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting.

   Participants at the meeting shall be familiar with Project and authorized to make binding decisions on matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Contract closeout, including the following:

   b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
   c. Requirements for preparing sustainable documentation.
   d. Requirements for submitting final operation and maintenance manual.
   e. Requirements for Permits, Licenses and Certificates.
   f. Preparation of Contractor's list of incomplete Work items.
   g. Procedures for processing Application for Payment at Substantial Completion and final payment.
   h. Submittal procedure.
   i. Installation of the Owner's furniture, fixtures, and equipment as provided by the Owner during the course of the Construction Contract.
   j. Responsibility for removing temporary facilities and controls.
   k. Preparation of consolidated Punch-List

4. Minutes: The Owner, the Owners’ Representative or Design Professional will record and distribute meeting minutes.

1.4 NOTICE OF SUBSTANTIAL COMPLETION (NOSC)

A. Substantial Completion: After the Work of the Contract is determined by the Owner and/or the Owners Representative, to be at Substantial Completion, the Contractor shall submit a written request to the Owner for a date of inspection. The date of Substantial Completion establishes the start of the guarantee period.

B. Documentation: The Notice of Substantial Completion (NOSC) form shall be executed at the end of inspection documenting incomplete Work items and submission of documents in accordance with this section that includes but is not limited to:
a. Preparation of a list of Work (Contractors List) to be completed and corrected, the value of Work items on the list, and completion date of each Work item.
b. Submittal of contract turnover documents. See Part 1.5 A for further details on this list.
c. Submittal of operation and maintenance manuals, testing, adjustment and balance records.
d. Delivery of tools, spare parts, extra materials, and similar items to location designated by the Owner and/or the Owners Representative. Label with manufacturer's name and model number where applicable.
e. Make final changeover of permanent locks and deliver keys to the Owner and/or the Owners Representative. Advise the Owner and/or the Owners Representative of changeover.
f. Termination and removal of temporary facilities from Project site, along with mockups, construction tools, and similar elements.
g. Completion of final cleaning requirements.

1.5 LIST OF INCOMPLETE ITEMS

A. Organization of List: Submit list of incomplete items in EXCEL spreadsheet electronic format. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
2. Include the following information at the top of each page:
   a. Project name & number.
   b. Date.
   c. Name of Contractor & Contract number.
   d. Page number.

B. Reinspection: Submit a written request for reinspection. On receipt of request, the Owner and/or the Owners Representative will either proceed with inspection or notify the Contractor of unfulfilled requirements. After inspection, the Owner and/or the Owners Representative will notify the Contractor of items, either on the Contractor's list or additional items identified, that must be completed or corrected.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis to proceed with
commencement of Contract Closeout Documents.

1.6 CONTRACT TURNOVER DOCUMENTS

A. Procedure: Contract turnover documents shall be transmitted to the Owner or, if stated, to the Design Professional, 15 continuous calendar days prior to requesting inspection date for Substantial Completion.

B. As-built Drawings: Transmit one paper copy set of marked-up As-built Drawings to the Design Professional, with copy of transmittal to Owner. Print each Drawing, whether or not changes and additional information were recorded.

C. As-built Specifications: Transmit one paper copy set of marked-up as-built specifications, including addenda and contract modifications to the Design Professional, with copy of transmittal to Owner.

D. As-built Schedule: Submit one electronic (PDF) copy, certified by the Contractor, of the schedule that reflects the exact manner in which the project was actually constructed, to the Owner.

E. Permits, Licenses and Certificates Documents: Submit one copy of original permits, licenses, certifications, inspection reports, material certificates/affidavits, approvals, and related documents required by authorities having jurisdiction to obtain Letter of Completion, Certificate of Occupancy, or Code Compliance Certificate. Coordinate and respond to requirements from the Owner, NYC Department of Buildings, or Municipality and all other authorities having jurisdiction for issuance of approval/documents required for the Owners’ use and occupancy.

1. Cooperate and help coordinate with agency testing of materials as specified in Section 014000 – Quality and Code Requirements. Testing Agency is required to submit final report of special inspections.

2. The Contractor to provide one copy of original certification from agency or firm certifying the following and as required by Individual Specification Sections:

   a. Sprinkler System – NFPA Forms for;
      1) Contractor’s Material and Test Certificate for Underground Piping
      2) Contractor’s Material and Test Certificate for Aboveground Piping
   b. Fire Alarm System – NFPA 72 Form for;
      1) Record of Completion
   c. Elevator – Certification Form from;
      1) Qualified Elevator Inspector (QEI)
d. Electrical – Certification Form from;
   1) Authority having jurisdiction
   2) Independent electrical inspection agency acceptable to the Owner

F. Hazardous Waste Documents: Submit four (4) paper copies of documents to the Owner 30 continuous calendar days prior to requesting inspection date for Substantial Completion. Refer to Individual Specification Sections for all requirements.

G. Miscellaneous Record Submittals: Refer to Individual Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one electronic (PDF) copy of each submittal.

H. Reports: Submit written report indicating items incorporated in Contract Documents concurrent with progress of the Work, including modifications, concealed conditions, field changes, product selections, and other notations incorporated.

I. In addition to the above, all approved record documents shall be submitted to the CM in electronic format acceptable to the Owner.

1.7 GUARANTEE

A. General Guarantee: Comply with General Terms and Conditions, Article 8 – Representations, Warranties and Guarantees and Article 15 – Miscellaneous. The date established on the Notice of Substantial Completion form constitutes commencement of the Guarantee period.

1.8 OPERATION AND MAINTENANCE MANUALS

A. Final Manuals Submittal: Submit Operation and Maintenance Manuals in final form to the Owner and/or the Owners Representative 15 continuous calendar days prior to requesting date of inspection for Substantial Completion.

1.9 CONTRACT CLOSEOUT (same as final application for payment)

A. Contract Compliance: The Contractor shall comply with the requirements of General Conditions, Section 10.08 – Limitations on Actions.

B. Preliminary Procedure: All Work and Extra Work of the Contract and requirements of this section must be complete and approved prior to commencement of Contract closeout.
1. The Contractor shall request and submit to the Owner and/or the Owners
Representative a final Contractor’s Pencil Copy billing request that will
formulate the final Application for Payment.
2. The Contractor shall provide outstanding documentation to the Owner and/or
the Owners Representative in accordance with General Terms and Conditions,
Article 10 – M/WBE Requirements and Article 11 – HIRENYC – Construction.

C. Procedures: Upon the Owner’s and/or the Owners Representative approval of the
Contractor’s Pencil Copy billing request, Contract closeout documents will be
provided to the Contractor. The Contractor shall complete each document and submit
all documents with original signature & notary as indicated on forms, the following:

1. Final Application for Payment that includes remaining Retainage.
3. Contractor and Subcontractor Certifications Form.
4. Contractor’s and Contractor’s Subcontractors’ Certified Payroll Form.
5. Release Form -- Final Payment to Contractor.
6. Consent of Surety -- Final Payment to Contractor, with power of attorney.

D. Payroll Forms: The Contractor and all Sub-contractors to the Contractor shall submit
original copies of the Contractor and Subcontractor Certifications Form and
Contractor’s Certified Payroll Form.

A. PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer
or fabricator of the surface to be cleaned. Do not use cleaning agents that are
potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not
applicable, use products that comply with allowable VOC levels.

PART 3 - EXECUTION

3.1 DEMOBILIZATION

A. Deliver tools, spare parts, extra materials, and similar items to location designated by
the Owner and/or the Owners Representative. Label with manufacturer's name and
model number where applicable.

B. Make final changeover of permanent locks and deliver keys to the Owner and/or the Owners Representative. Advise the Owner's and/or the Owners Representative personnel of changeover.

C. Terminate and remove temporary facilities from the Project site, along with mockups, construction tools, and similar elements.

3.2 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for contract turnover document purposes. Post changes and modifications to contract turnover documents as they occur; do not wait until the end of the Project.

B. Maintenance of Turnover Documents and Samples: Store turnover documents and Samples in the field office apart from the Contract Documents used for construction. Contract turnover documents shall not be used for construction purposes. Maintain turnover documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to contract turnover documents for the Owner’s and/or the Owners Representative reference during normal working hours during performance of Contract.

3.3 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations to the Owners and/or the Owners Representative’s satisfaction. The Contractor shall repeat final cleaning at any and all deficient areas as designated by the Owner and/or the Owners Representative until such areas are accepted by the Owner and/or the Owners Representative at no additional cost to the Owner.

B. Cleaning: Employ professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations as applies to Work of the contract.
   a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste
material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Remove tools, construction equipment, machinery, and surplus material from Project site.
d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
f. Sweep concrete floors broom clean in unoccupied spaces.
g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain. Replace if soil or stains remain after shampooing.
h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
i. Remove labels that are not permanent.
j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.

k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

l. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

n. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

o. Leave Project clean and ready for occupancy.
C. Construction Waste Disposal: Comply with waste disposal requirements in all other applicable sections.

B. END OF SECTION 01 77 00
SECTION 02 08 30
REMOVAL OF UNIVERSAL WASTE AND MISCELLANEOUS HAZARDOUS MATERIALS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Description Of Work

1. This work shall include proper removal, storage, transportation and recycling or lawful disposal of Universal Waste and Miscellaneous Hazardous Materials affected by this project, to include fluorescent light bulbs. Table 1 below summarizes the Universal Waste and Miscellaneous Hazardous Materials that require removal for this project.

<table>
<thead>
<tr>
<th>Description of Material</th>
<th>Location</th>
<th>Total Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorescent 2x4 Fixtures</td>
<td>Painting Studio D626</td>
<td>14</td>
<td>Each</td>
</tr>
<tr>
<td>Total Material Quantities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorescent light bulbs, 4’ length, straight</td>
<td>14</td>
<td>Each</td>
<td></td>
</tr>
</tbody>
</table>

B. Submittals

1. Before Start of Work: Submit the following to the Owner's Representative for review. Work shall not commence until these submittals are returned with approval from the Owner's Representative.

   a. Copy of State or local license for hazardous waste hauler;
   b. Certification of at least one on-site supervisor which has satisfactorily completed the OSHA 40 Hour Health and Safety Course for Handling Hazardous Materials
   c. Certificates of workers which have successfully completed at least the OSHA 40-Hour Health and Safety Course for Hazardous Materials;
d. Certificates of workers which have successfully completed the required employee training for universal waste or appropriate type of training to the type of wastes being managed;
e. Schedule of start and finish times and dates for this work;
f. Name and address of the universal waste handler or a destination facility where the waste materials is to be treated, deposited or recycled in accordance with all regulatory requirements (include contact person and telephone numbers), if the universal waste meets the definition of hazardous waste, the name and address of the hazardous waste treatment, storage and disposal (TSD) facility;
g. Material Safety Data Sheets for all materials requiring removal;
h. If Contractor introduces any chemical into the work environmental, a MSDS for that chemical is required before use;
i. Contingency Plan for handling emergency spills or leaks;
j. Provide a copy of the NYS DEC Part 364 Waste Transporter permit for Universal Waste Transporters that transport more than 500 pounds of universal waste in a single shipment since they must be a permitted hazardous waste transporter.
k. Large Quantity Handlers of universal waste must provide documentation of notification to the EPA and/or the appropriate local government agency in advance of its intentions to transport the waste and receive from the facility or provide an EPA identification number prior to exceeding 5,000 kilograms of waste on-site.

C. Removals
1. Contractor to remove and turn over to FIT the following equipment NOT for disposal-
   a. LED Lighting
   b. Fire Extinguishers
2. Contractor to reclaim and recycle refrigerant gas (type and quantity unknown) associated with equipment to be removed and disposed of.
3. Contractor to notify FIT of any WIFI router and/or security cameras present prior to demolition. It will be the responsibility of the College to remove.

D. Definitions
1. Large Quantity Handler (LQH) of Universal Waste shall be a waste handler who accumulates 5,000 kilograms or more of universal waste (batteries, pesticides, thermostats, or lamps, calculated collectively) at any time. This designation as a large quantity handler of universal waste is retained through the end of the calendar year in which 5,000 kilograms (11,000 pounds) or more total of universal waste is accumulated. The LQH shall notify the EPA, acquire or co-ordinate with a facility regarding an EPA identification number, and provide records for each shipment. The LQH shall ensure all
employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal facility operations and emergencies.

2. Small Quantity Handler of Universal Waste (SQH) shall be a waste handler who does not accumulate 5,000 kilograms (11,000 pounds) or more of total universal waste (batteries, pesticides, thermostats, or lamps, calculated collectively) at any time.

3. Destination Facility shall be a facility that legitimately and can legally accept universal waste from offsite so that the universal waste can be treated, disposed, or recycled in accordance with the regulatory requirements.

4. Universal Waste Transporter shall be anyone who transports universal waste. In New York, universal waste transporters that transport greater than 500 pounds of universal waste in a single shipment must be a permitted hazardous waste transporter pursuant to Federal and State regulations. Proper notification with the receiving handler agreeing to receive the shipment is required by the Universal Waste Transporter.

5. Employee training shall ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal operations and emergencies and to the type of waste they are handling.


1.2 PRODUCTS

A. Materials

1. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil thick, clear, frosted, or black.

2. Duct Tape: Provide duct tape in 3" widths, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

3. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.


5. Labels: As required by the EPA and OSHA for handling, transportation, and disposal of hazardous waste.

6. Drums: Recovery or salvage drums acceptable for disposal of hazardous waste. Prior approval of drums is required. Drums or containers must meet the required OSHA EPA (40 CFR Parts 264-265 and 300), and DOT regulations (49 CFR Parts 171-178). Use of damaged drums will not be allowed.

1.3 EXECUTION

A. Universal Waste
1. Once the properly labeled containers holding the universal waste have been filled and sealed, they shall be stored in designated accumulation areas as approved by the Owners Representative. The Contractor shall not store waste in transportation vehicles, or store waste onsite for more than one year from when the waste has been generated.

2. Documentation when a universal waste in storage was first accumulated shall be provided. This is to be done by dating and labeling the waste with the date of the earliest accumulation that can document the length of time the universal waste has been accumulated.

3. Maintenance of an inventory system on-site that identifies the earliest date that any universal waste in a group of universal waste items or a group of containers of universal waste became a waste was received.

4. Any waste developed from the work that exhibits one or more characteristics of hazardous waste must be handled accordingly and not as a universal waste.

B. Off-Site Shipment of Universal Waste

1. Off-Site shipments shall meet the requirements for offsite shipments, as such, the Contractor is prohibited from sending or taking universal waste to a place other than a designated universal waste handler or a universal waste destination facility.

2. LQH’s of universal waste must notify EPA in writing and develop an EPA identification number or co-ordinate with the facility regarding use of their EPA identification number, prior to exceeding 5,000 kilograms of universal waste onsite.

3. SQH’s do not need to notify EPA, receive and EPA identification number or keep records of shipments of universal waste.

4. LQH’s must keep a record of all universal waste shipments received or sent offsite, and must retain those records for at least three years from the date of receipt or shipment. Records may include invoices, manifests, logs, bills or lading, or other shipping documents.

C. Storage Of Hazardous Waste (if required)

1. Once the properly labeled containers holding the hazardous waste have been filled and sealed, they shall be stored in designated areas as approved by the Owners Representative. The Contractor shall not be allowed to store the hazardous waste for more than the storage limitations relating to quantities stored and the length of time the material may be stored.

2. Documentation when a hazardous waste in storage was first stored shall be provided. This is to be done by dating and labeling the waste with the date of the earliest accumulation that can document the length of time the hazardous waste has been accumulated.
3. Maintenance of an inventory system on-site that identifies the earliest date that any hazardous waste was placed into proper storage.

D. Off-Site Shipment of Hazardous Waste

1. Off site shipments shall meet the requirements for offsite shipments and the Contractor is prohibited from sending or taking hazardous waste to a place other than an authorized treatment, storage and disposal (TSD) facility.
2. An EPA identification shall be developed or provided by the facility.
3. A copy of the transporter’s Part 364 Permit shall be provided to the Owner’s Representative and the facility representative.
4. A copy of all waste manifests and any test results or waste analysis utilized for the off-site transportation and disposal shall be submitted to FIT.

E. Records
1. For all Universal Waste and Miscellaneous Hazardous Materials removed under this project, the Contractor shall provide a copy of the following documentation to the owner within 60 days of removing waste from campus:
   i. Hazardous Waste Manifest for all Hazardous Waste removed, to include any and all associated weight tickets that clearly identify the quantity of material disposed. These documents shall be signed or stamped by the receiving facility as applicable.
   ii. Bill or Lading for Universal Waste or Miscellaneous Hazardous Materials removed, to include any and all associated weight tickets that clearly identify the quantity of material disposed. These documents must be signed or stamped by the receiving facility as applicable.

END OF SECTION 02 08 30
SECTION 02 41 13 - SELECTIVE REMOVALS AND DEMOLITION

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Construction Waste Management - Section 01 74 19
B. Cutting and Patching - Section 01 73 29
C. Removal of Universal Waste and Miscellaneous Hazardous Materials – Section 02 08 30

1.2 SUMMARY

A. Perform all demolition in accordance with the Contract Documents. The Work of this Section shall include but not be limited to the following:
   1. Removal of selected items to accommodate new construction
   2. Removal of interior finishes and other items, to accommodate new construction.
   3. Protect existing items to remain.
   4. The maintenance of the College’s operations during selective demolition operations.
   5. Protection of the cables and utilities serving other buildings and other areas at the College Campus during the demolition and construction activities. The above services shall be maintained in operation without any interruption at all times unless otherwise scheduled and authorized by the Campus.
   6. Remove and reinstall existing woodworking exhaust system.

1.3 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the College's property.
B. Remove and Salvage: Items indicated to be removed and salvaged, remain the College's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to the College’s designated storage area.
C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated by College representative.
D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.
1.4 SUBMITTALS

A. Proposed schedule of operations including coordination for shutoff, capping, and continuation of utility services as required.
   1. Provide a detailed sequence of selective demolition and removal work to ensure uninterrupted progress of the College’s on-site operations.
   2. Coordinate with the College’s continuing occupation of certain portions of the existing building.
   3. Include proposed methods for dust and noise control measures.
   4. Contractor to submit intermediate life safety plan demonstrating how required government regulations will be maintained for occupied portions of the building.

1.5 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition work similar to that indicated for this Project.
B. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Fluorescent tubes shall be considered hazardous waste and shall be disposed of according to the regulations of the New York State EPA.
   1. All demolition work shall comply with requirements of the College’s operational requirements and authorities having jurisdiction.
      a. Coordinate with the College’s engineering department.
C. Contractor shall verify all conditions at site prior to the start of Work.
D. Notify appropriate agencies of any hazardous materials unearthed at the site. Do not proceed with removal of said substances until so instructed.

1.6 JOB CONDITIONS

A. Condition of Structures: The College assumes no responsibility for actual condition of structures to be demolished.
   1. Conditions existing at time of inspection for bidding purpose will be maintained by the College insofar as practicable.
B. Explosives: Use of explosives will not be permitted. Explosives will not be permitted for any work of the project.
C. Traffic: Conduct selective demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
   1. Do not close or obstruct exiting pathways, streets, walks, or other occupied or used facilities without permission from the College and authorities having jurisdiction. Provide alternate routes around closed or
obstructed pedestrian and vehicular traffic ways as required by governing authorities or regulations.

D. Protections: Ensure safe passage of persons around area of demolition. Conduct operations to prevent damage to adjacent buildings, structures, and other facilities and injury to persons.
   1. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structures to be demolished and adjacent facilities to remain.

E. Damages: Promptly repair damages caused to adjacent areas and facilities by demolition operations.

F. Flame Cutting: Do not use cutting torches for removal of material to be salvaged. Do not use cutting torches for demolition or removal until work area is cleared of flammable materials. Maintain portable fire suppression devices during flame-cutting operations.

G. Utility Services: Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.
   1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities and/or the College.

H. Utility Services: Do not start demolition work until utility disconnections have been completed and verified in writing.

I. Environmental Controls: Use temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
   1. Do not use water when it may create hazardous or objectionable conditions such as damage to finishes, flooding, and pollution.

1.7 SCHEDULING

A. Arrange selective demolition schedule so as not to interfere with the College’s on-site operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.
   1. Where identical materials are, unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible, consult with the Architect.
   2. Use materials whose installed performance equals or surpasses that of existing materials.
PART 3 – EXECUTION

3.1 EXAMINATION

A. General: Prior to commencement of selective demolition operations, verify that existing utilities have been located, identified, disconnected and capped.
B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.
E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition. Design for shoring and bracing shall be prepared by an engineer licensed in the State of New York.
F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Architect and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the Architect and to governing authorities.
      a. Provide not less than 72 hours notice to the College if shutdown of service is required during changeover.
B. Utility Requirements: Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

A. General: Provide shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.
   1. Cease operations and notify College Safety Officer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations. Maintain interior and exterior shoring and bracing throughout the term of this Contract.
2. Cover and protect equipment and fixtures from soilage or damage when selective demolition work is performed in areas where such items have not been removed.

3. Erect and maintain dust-proof partitions and closures as required, to prevent spread of dust or fumes, to occupied portions of the building.
   a. Where selective demolition occurs immediately adjacent to designated portions of the building, construct dust-proof partitions of minimum 3 5/8-inch studs at 16 inches on center, 5/8-inch drywall (joints taped) on occupied side, ½-inch fire-retardant plywood on demolition side. Fill partition cavity with sound-deadening insulation. Create dust-tight joints at edges and penetrations of dust-proof partitions.
   b. Provide weatherproof closures for exterior openings resulting from demolition work.

4. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.
   a. Provide bypass connections as necessary to maintain continuity of service to designated areas of building. Provide minimum of 72 hours advance notice to the College if shutdown of service is necessary during changeover.

B. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air. Comply with governing regulations pertaining to environmental protection.
   1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

D. Demolition, General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition work above each floor or tier before disturbing supporting members on lower levels.
   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting
operations. Maintain portable fire-suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

8. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.

9. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

E. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the Architect in written, accurate detail. Pending receipt of directive from the Architect, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

A. General: As a minimum, remove weekly from site accumulated debris, rubbish, and other materials resulting from demolition operations. However, more frequent off site removal of accumulated debris is required as soon as the dumpster is full.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

2. Burning of demolished materials will not be permitted on site.

B. Removal: Transport materials removed from demolished structures and legally dispose off site.

3.5 CLEAN-UP AND REPAIR

A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site.

1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by demolition work.

2. Clean adjacent areas, of all dust, dirt, and debris caused by selective demolition, cutting, and patching operations. Daily and final clean up shall be satisfactory to the Architect.

3. Clean existing heating and cooling devices to remain.
END OF SECTION 02 41 13
SECTION 04 01 42 - UNIT MASONRY

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes, but is not limited to, the following:
   1. Miscellaneous patching of CMU
   2. Miscellaneous replacement of CMU

1.2 DESIGN REQUIREMENTS

A. Existing CMU shall be parged to provide appropriate surface for plaster patching where required.
B. Mortar types to be used at the following locations, unless otherwise stated:
   1. Concrete masonry units – type N unless otherwise stated.

1.3 REFERENCES

References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

   A706 Standard Specifications for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
   C33 Standard Specification for Concrete Aggregates.
   C90 Standard Specification for Hollow, Load-Bearing Concrete Masonry Units.
   C129 Standard Specification for Non-Load-Bearing Concrete Masonry Units.
   C140 Standard Methods of Sampling and Testing Concrete Masonry Units.
   C144 Standard Specifications for Aggregate for Masonry Mortar.
   C270 Standard Specification for Mortar for Unit Masonry.
   C331 Standard Specification for Lightweight Aggregates for Concrete Masonry Units.
   C595 Standard Specifications for Blended Hydraulic Cements.

B. Industry Standards.
   1. "Standard for Concrete Masonry Units" - UL 618- Underwriters Laboratory.
1.4 SUBMITTALS

A. Product Data: Submit Product Data to show compliance with specified requirements.
   1. Submit complete data for masonry units. Laboratory test reports for brick shall be no more than two years old. Submit a list indicating the maximum dry weight of each type and size of CMU to be used in the project.
   2. Submit complete data for reinforcement and ties, of each type.
   4. Lime: Brand and manufacturer's name.
   5. Packaged Products: Manufacturer's specifications and application instructions.
   6. Sand: Location of pit, name of owner, and previous test data.
   7. Masonry reinforcement, anchors
   8. Masonry cleaner, including specific masonry manufacturer’s recommended cleaning procedure for the product selected.

B. Samples:
   1. 2 samples of each type of wall tie and truss tie.

C. Sustainable Submittals:
   1. Submit Contractor’s Sustainable Materials Form with complete information on recycled and regional content for materials. Include cost of all materials, distance in miles to point of materials extraction and manufacture and percentage, by weight, of materials that have post-consumer or pre-consumer recycled content for the following:
      a. Concrete masonry units.
   2. Submit documentation of recycled and regional content in concrete masonry unit materials – product data, mix design information, or manufacturer’s statement.

1.5 QUALITY ASSURANCE

A. Qualifications: Company specializing in the Work of this Section shall have a minimum of three years experience and at least two projects with similar quantity of materials.

B. Regulatory Requirements
   1. Building Code: Work of this Section shall conform to all requirements of the NYC Building Code and all applicable regulations of governmental authorities having jurisdiction, including safety, health, noise, and anti-pollution regulations. Where more severe requirements than those contained in the Building Code are given in this Section, the requirements of this Section shall govern.
1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in undamaged condition per ASTM guidelines. Store in an enclosed location or off the ground with waterproof covering as needed to protect all materials from moisture, contaminants, corrosion, deleterious temperature changes, and other harmful conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Aggregate for Concrete Masonry Units (CMU)
   1. Northeast Solite Corporation, Mt. Marion, N.Y.
   2. Norlite Corporation, Cohoes, N.Y.

B. Reinforcement and Ties
   1. Hohmann & Barnard, Inc., Hauppauge, N.Y.
   2. Dur-O-Wall, Arlington Heights, IL.

C. Mortar Additives
   1. ACM Chemistries, Norcross, GA 30010
   2. Master Builders, Inc., Cleveland, OH 44122
   3. Sika Corp., Lyndhurst, NJ 07071

2.2 MATERIALS

A. Base Materials
   1. Portland Cement
      Type I         ASTM C150
   2. Sand for Mortar Mix
      Sand shall be washed natural sand with 100% passing the No. 8 sieve. Mix shall not contain chlorides.
      ASTM C144
   3. Aggregate for CMU - 100% light weight aggregate, expanded clay shale or slate (rotary kiln process). To meet recycled content, lightweight recycled aggregate of up to 20% of total material that will maintain the same fire resistance equivalent thickness of 100% expanded shale, clay, or slate without a decrease in block strength may be used.
      ASTM C331
   4. Hydrated Lime
      Type "S"         ASTM C207
   5. Water - Clean, potable New York City water free of injurious materials.

B. Concrete Masonry Units (CMU)
   1. Types: Hollow Load-Bearing: ASTM C90, Type I. Aggregate shall conform to ASTM C331.
2. Size
   a. Nominal face dimension 8" x 16" or 8"x18", except as noted otherwise.
   b. Unit weight: Unit weight of concrete for CMU not to exceed 90 pcf when tested in accordance with ASTM C140 (105 pcf for the high strength CMU).

3. Concrete masonry units shall be manufactured with a minimum of 3% pre-consumer content materials. A maximum ratio of 40% slag to Portland cement is permitted for cementitious materials and 20% recycled lightweight material (such as fly ash) to expanded clay shale, or slate for aggregate, as long as the required strength to meet ASTM C90 is met, the weights are the same, and the equivalent thickness to meet fire-resistance ratings is the same as block with 100% expanded clay, shale, or slate.

C. Joint Reinforcement and Ties
   1. Material
      b. Width of truss and mesh reinforcement to place edge of reinforcement 1" from each face of masonry.

2. Manufactured Units. Units are listed by Hohmann & Barnard model number in order to establish a standard for comparison. Deliver all units with manufacturer’s printed installation instructions.
   a. Interior Concrete Masonry Unit Walls: LOX-ALL #120 Truss-Mesh, 9 gage, of proper width for wall thickness.

D. Masonry Cleaner: Masonry cleaner capable of cleaning masonry without degrading the masonry material or mortar. Cleaner must be approved by the masonry manufacturer.

2.3 MIXES

A. Mortar (basic)
   Shall conform to ASTM C270 and BIA M1-88. Provide Type I Portland cement (Type II Portland Cement when used for manholes). Masonry cement shall not be used as a substitute. Preconstruction testing with the proportions carefully monitored is to be used to establish the upper end of the strength range, which should generally be near the minimum strength of the next higher strength mortar.
   1. Type N: 1 part gray cement, 1 part lime, 6 parts dry sand. Minimum compressive strength shall be 750 psi at 28 days.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine all adjoining Work on which this Work is in anyway dependent for proper installation and workmanship. Report to the Architect any conditions that prevent the performance of this Work.

3.2 MIXING PROCEDURES FOR MORTAR

A. Measure material by volume or equivalent weight. In measuring by volume, measure ingredients by container. Do not measure by shovel.

B. Mix ingredients in a clean mechanical mixer for a minimum of 3 minutes, maximum of 5, with the minimum amount of water to produce a workable consistency.

C. Mortar that has stiffened because of evaporation of water from the mortar may be retempered only once, and only during the first hour of placement to restore the required consistency. Mortar shall be used within 2 1/2 hours after initial mixing. Limit amount of mortar batched at one time to stay within these requirements.

3.3 LAYING - GENERAL

A. Lay units true to dimensions, plumb and level, square; exterior and interior bond work in bond indicated on the Drawings or specified herein. Lay courses level with joints uniform; vertical joints spaced properly for plumb alignment.

B. Fill bed joints and cross joints solid with mortar. Furrowed bed and spotted cross joints not permitted. For hollow block units, apply mortar full length on all bearing surfaces.

C. "Tooth" openings in masonry walls, to maintain proper bond when closed.

D. Rough cut joints in masonry that are to receive plaster, to provide good plaster bond.

E. Remove excess mortar, leaving masonry surface clean.

F. Cut concrete masonry units with circular masonry wet saw.

3.4 CONCRETE MASONRY UNITS (CMU)

A. General
   1. Lay blocks with cells vertical. Provide running bond.
   2. Where interior partitions intersect other partitions or walls, bond together with metal wall ties spaced 2'-0" o.c. min., vertically.

B. Horizontal and Vertical Face Joints
   1. Make joints uniform and 3/8" thick, unless otherwise indicated.
   2. Shove vertical joints tight.
   3. Tool joints flush where plaster is to be applied.

C. Exposed and Painted Surfaces
1. Smooth, even texture, free of chips, cracks, or other imperfections and free from any material that will stain paint.

3.5 GENERAL - CUTTING, FITTING AND LAYING

A. Cut units for exposed Work with motor-driven carborundum wet saw; provide smooth, straight edges.
B. Provide necessary cuts to fit tightly in and around mechanical installations.
C. Where split block units are used to conceal piping or other installations, provide reinforcement for bonding the split units together.
D. Remove mortar protrusions that extend into cells or cavities which are to be reinforced and filled.
E. Set block up with special care for plane, jointing, pattern, and cutting.
F. Keep faces of units clean; clean off mortar droppings on block face immediately.
G. Extend interior partitions to underside of slabs and beams. Leave sufficient space between partition and slab/arch/beam to install firestopping materials where required. Install sealant to top of wall and at bottom of wall.

3.6 REINFORCEMENT

A. General
   1. Interior Concrete Masonry Units
   2. Provide mesh continuous at every third block course.
B. Provide galvanized steel bent straps secured to slab, to brace tops of interior masonry partitions where required.

3.7 CLEANING

A. Concrete Masonry Units
   1. Clean wall surfaces to be painted; rub with carborundum stone: remove mortar from surfaces; remove rough edges from joints.
   2. Point up holes and joints. Brush with stiff bristle brush. Leave surface in condition to receive paint.
   3. Do not use wire brush.

END OF SECTION 04 01 42
SECTION 05 17 00 - SUPPORT SYSTEM FOR SUSPENDED CEILINGS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide structural ceiling suspension system as indicated on the Drawings and as specified herein, for all suspended ceiling systems.
B. This suspension system shall include the attachment to overhead slab, steel angle, plate hanger, and running (carrying) channels and supports.
C. Provide supports for furred areas, and for opening frames, lighting fixtures, furred ceilings and other items.
D. Furring members and other attachments for the various ceiling materials and systems shall be as specified in the respective Section.

1.02 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
B. American Society for Testing and Materials (ASTM)
   1. A36 - Specification for Structural Steel

1.03 SUBMITTALS

A. Submit Shop Drawings showing suspension assembly, indicating all components, connections and anchorages.
B. Submit product data for all components, connections and anchorages.
C. Submit one (1) samples of each component of the assembly.
D. Submit sample of anchor and descriptive literature indicating its characteristics; submit laboratory report certifying pullout and shear capabilities for the anchor embedded in the materials to be used in this Project.
E. “Coordination Drawings” per Part 3 of this Specification Section.
1.04 REGULATORY REQUIREMENTS

A. New York City Building Code.
B. New York City Materials Equipment Acceptance (MEA).

PART 2 - PRODUCTS

2.01 MATERIALS

A. Hangers and Clips
   1. Steel Angle and Plate Hanger
      ASTM A36. Provide angle 3"x3"x3/16"x1" wide, with 1 3/8" long
         slot for 3/8" bolt. Provide plate hanger 1" wide x 1/8" minimum
         thickness, with 1 3/8" long slot for 3/8" bolt. Increase thickness of
         plate hanger where required to support all loads suspended
         therefrom plus an additional 200 pounds located at midspan
         between hangers. Provide painted units at all locations unless
         indicated otherwise.
   2. 3/8" rods attached to ceiling with approved
      attachment.

B. Bolts
   1. ASTM A307, 3/8" diameter, with lock washers and nuts. Provide
      shop coat of paint.

C. Running (Carrying) Channels
   1. Minimum dimensions: 1 1/2" deep x 7/16" wide flanges; S(in.³) =
      .0538, I(in.⁴) .0404; 475 lbs. per 1000' painted; 508 lbs. per 1000'
      galvanized; and as indicated on the Drawings. Provide galvanized
      channels for kitchen ceilings. Provide shop painted channels at other
      locations unless indicated otherwise on the drawings.
   2. Increase size of channels where required such that midspan deflection,
      under all loads supported therefrom, shall not exceed 1/360 of the span, in
      accordance with the New York City Building Code. Loads shall include all
      ceiling materials, lighting fixtures, and other equipment and items supported
      by the channels.
   3. ASTM A568 for painted channels.

D. Anchors (hanger assembly to deck)
   1. Manufacturers
      a. Hilti Fastening Systems.
      b. Illinois Tool Works, Inc.
      c. ITW Ramset
      d. Simpson Strong-Tie Co., Inc.
   2. Stainless Steel or Galvanized
   3. Anchors
      a. Expansion bolt or powder actuated fastener of capacity
         indicated below.
      b. Threaded stud or internally threaded sleeve anchor of
4. Safe working loads: For pullout 300 lbs. (minimum); for shear 300 lbs. (minimum); for strength of concrete (minimum 3,000 p.s.i. lightweight concrete). Provide increased pullout capacity as required to ensure that each hanger is capable of carrying all loads suspended therefrom plus additional 200 pounds loads located at midspan of running channels.

5. Isolators - Mason Industry 30 NCC. Precompressed 30N hanger with ceiling channel clamps.

2.02 PAINTING

A. All steel members and accessories of the support system unless galvanized or of stainless steel, shall be dipped or painted with one coat approved asphaltum paint.

PART 3 - EXECUTION

3.01 COORDINATION WITH OTHER Trades

A. Coordinate this Work with the various trades who may have ducts, pipes, conduits, or other Work in the spaces above the suspended ceilings, in order that anchors, hangers and running channels may be properly placed to avoid such ducts, pipes, conduits, and other obstructions. Any changes required to be made in the locations of anchors, hangers, and running channels by reason of the Contractor's failure to observe this requirement shall be made by the Contractor without additional cost to the Owner.

B. Coordinate Work with ceiling systems work.

C. Provide “Coordination Drawings” of any Work above suspended ceilings. Such “Coordination Drawings” shall indicate all penetrations and interferences with the ceiling height.

1. The “Coordination Drawings” shall be drawn at a scale of no less than 3/8" = 1'-0" and shall represent the coordinated Work of all the following building elements (if required):
   - structure
   - ceiling construction
   - mechanical
   - electrical
   - plumbing
   - fire protection

3.02 SUPPORT SYSTEM LOCATIONS
3.03 INSTALLATION

A. Secure 3" x 3" steel angle to structural concrete deck or structural steel with approved anchors. To accommodate the running channel layout space anchors at 48" o.c. maximum in each direction, and as indicated on the Drawings.

B. Attach steel plate hangers to angle with 3/8" diameter bolt, lock washer, and nut.

C. Attach running channels to plate hangers with 3/8" diameter bolt, lock washer and nut.

D. Install channels level, true to grid layout, at proper height, ready to receive the ceiling system: furring members for lath and plaster or gypsum board. Provide type of clip required to maintain indicated ceiling height in coordination with clearances required for equipment above the ceiling.

E. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

3.04 CEILING OPENINGS

A. Provision shall be made for the installation of lighting fixtures, ventilating or air conditioning equipment, sprinkler heads, access openings, and other ceiling openings.

B. Rigid frames of furring members shall be provided around openings, adequately braced and reinforced.

END OF SECTION
SECTION 05 50 00 - METAL FABRICATIONS

PART 1   GENERAL

1.01 WORK OF THIS SECTION INCLUDES:
All structural steel framing and framing to support various architectural components.

1.02 REFERENCES
A. Except as shown or specified otherwise, the Work of this Section shall meet the requirements of the following:
1. Design and Fabrication of Cold-Formed Shapes: “Specification for the Design of Cold-Formed Steel Structural Members”, by the American Iron and Steel Institute (AISI Specification).

B. Organizations:

1.03 SUBMITTALS
A. Shop Drawings: Show application to project. Furnish setting drawings and templates for installation of bolts and anchors in other Work. Indicate shop and field welds by standard AWS welding symbols in accordance with AWS A2.4.

B. Product Data: Catalog sheets, specifications, and installation instructions for each fabricated item specified, except submit data for fasteners only when directed.

1.04 DELIVERY AND STORAGE
A. Coordinate delivery of items to be built into other construction to avoid delay.

B. Promptly cover and protect steel items delivered to the Site.

METAL FABRICATIONS 05 50 00 - 1
PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Shapes, Plates, and Bars: ASTM A 36.

B. Steel Plates to be Cold-Formed: ASTM A 283, Grade C.

C. Steel Bars and Bar-Size Shapes: ASTM A 675, Grade 70; or ASTM A 36.

D. Cold-Finished Steel Bars: ASTM A 108, grade as selected by fabricator.

E. Steel Tubing: Hot-formed, welded or seamless, structural tubing; ASTM A 501.

F. Cold-Drawn Steel Tubing: ASTM A 512, buttwelded, cold-finished carbon steel tubing, sink drawn and stress relieved.


H. Steel Pipe: ASTM A 53, type as selected, Grade A; black finish unless galvanizing is required; standard weight (Schedule 40), unless otherwise shown or specified.

I. Anchors: Except where shown or specified, select anchors of type, size, style, grade, and class required for secure installation of metal fabrications. For exterior use and where built into exterior walls, anchors shall be galvanized or of corrosive-resistant materials.
   1. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below 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, conducted by a qualified independent test agency.
      b. Stainless Steel: Bolts, Alloy Group 1 or 2; ASTM F593, Nuts; ASTM F 594.

J. Fasteners: Except where shown or specified, select fasteners of type, size, style, grade, and class required for secure installation of metal fabrications. For exterior use and where built into exterior walls, fasteners shall be galvanized.
   2. Stainless Steel Fasteners: ASTM A 666; Type 302/304 for interior Work; Type 316 for exterior Work; Phillips flathead (countersunk) screws and bolts for exposed Work unless otherwise specified.
   4. Machine Bolts: ASME B18.5 or ASME B18.9, Type, Class, and Form as required.
10. Toggle Bolts: Spring Wing Type; Wing AISI 1010, Trunion Nut AISI1010 or Zamac Alloy, Bolt Carbon Steel ANSI B18.6.3.

K. Shop Paint (General): Universal shop primer; fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

L. Shop Paint for Galvanized Steel: Epoxy zinc-rich primer; complying with MPI#20 and compatible with topcoat.

M. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

2.02 MISCELLANEOUS FRAMING AND SUPPORTS

A. Fabricate metal framing and supports to support related items required by the Work. Fabricate of welded construction unless otherwise indicated. Preassemble to largest extent possible, off site.

2.03 MISCELLANEOUS STEEL TRIM

A. Fabricate trim of shapes, sizes, and profiles shown, with continuously welded joints and ground smooth exposed edges, unless otherwise indicated or approved. Use concealed field splices wherever possible. Furnish necessary cutouts, fittings, and anchorages.

2.04 FABRICATION

A. Use materials of size and thickness indicated. If not indicated, use material of required size and thickness to produce adequate strength and durability for the intended use of the finished product. Furnish suitable, compatible anchors and fasteners to support assembly.

B. Fabricate items to be exposed to view of material entirely free of surface blemish, including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove surface blemishes by grinding or by welding and grinding prior to cleaning, treating, and finishing. Ease exposed edges to a radius of approximately 1/32 inch unless otherwise shown.

C. Joints: Fabricate accurately for close fit. Weld exposed joints continuously unless otherwise indicated or approved. Dress exposed welds flush and smooth.
D. Connections: Form exposed connections with flush, smooth, hairline joints. Use concealed fasteners wherever possible. Use Phillips flathead (countersunk) bolts or screws for exposed fasteners, unless otherwise shown or specified.
   1. Furnish flat washer under connections requiring raised bolt heads.
   2. Furnish lock washer under nuts when through-bolting occurs.

E. Punch, reinforce, drill, and tap metal Work as required to receive hardware and other appurtenant items.

F. Galvanizing:
   1. Unless otherwise specified or noted, items indicated to be galvanized shall receive a zinc coating by the hot-dip process, after fabrication, complying with the following:
      a. ASTM A 153 for iron and steel hardware.

G. Shop Painting:
   1. Cleaning Steel: Thoroughly clean all steel surfaces. Remove oil, grease, and similar contaminants in accordance with SSPC SP-1 “Solvent Cleaning”. Remove loose mill scale, loose rust, weld slag and spatter, and other detrimental material in accordance with SSPC SP-2 “Hand Tool Cleaning”, SSPC SP-3 “Power Tool Cleaning”, or SSPC SP-7 “Brush-Off Blast Cleaning”.
   2. Apply one coat of shop paint to all steel surfaces except as follows:
      a. Do not shop paint steel surfaces to be field welded.
      b. Apply 2 coats of shop paint, before assembly, to steel surfaces inaccessible after assembly or erection. Paint color to be determined by Architects.
   3. Apply paint and compound on dry surfaces in accordance with the manufacturer’s printed instructions, and to the following minimum thickness per coat:
      a. Shop Paint (General): 4.0 mils wet film.
      b. Cold Galvanizing Compound: 2.0 mils dry film.

PART 3 EXECUTION

3.01 INSTALLATION

A. Fit and set fabricated metal Work accurately in location, alignment, and elevation. Securely fasten in place. Cut off exposed threaded portion of bolts flush with nut.

END OF SECTION 05 50 00
SECTION 05 71 00 – MISCELLANEOUS METALS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

1. Installation accessories.
2. Channels, metal pans and plates.
3. Metal blocking

1.2 REFERENCE STANDARDS

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

   A501 Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
   A568 Standard Specification for Steel, Sheet, Carbon, and High Strength Low Alloy, Hot Rolled and Cold Rolled
   A325 Standard Specification for Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength Structural Bolts
   A563 Standard Specification for Carbon and Alloy Steel Nuts
   E70 Standard Test Method for PH of Aqueous Solutions with the Glass Electrode
   E985 Standard Specification for Permanent Metal

2. ANSI/BHMA (A156.9-2003) American National Standard for Cabinet Hardware

   D1.1 “Structural Welding Code – Steel”
   D1.2 “Structural Welding Code – Sheet Steel”

1.3 SUBMITTALS

A. Shop Drawings

1. Submit Shop Drawings for all grilles, control joints and trims. Installation to be coordinated with field conditions, adjacent materials installation. Sizes will vary.
B. Manufacturer’s Data

Submit manufacturers catalog data for:
1. Paint Grade Products
2. Adjustable Shelving Metal Brackets

1.4 PERFORMANCE CRITERIA

A. Assume all responsibility for the correctness and accuracy of installation, and take and verify all measurements at the Building. The Contractor shall assume full responsibility for the correctness of dimensions and fit.

1.5 QUALITY ASSURANCE

A. Fabricators: Five (5) years minimum experience in steel fabrications of similar Work.

B. Welding – Shop & Field: Certify that each welder has satisfactorily passed qualification tests for welding processes involved and, if pertinent, has undergone recertification.

C. Comply with requirements specified herein of the New York City Building Code.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Fry Reglet Reveals and Moldings:
   1. Fry Reglet Corporation     Fry Reglet Corporation
      1377 Stonefield Court     12342 Hawkins Street
      Alpharetta, GA 30004     Santa Fe Springs, CA 90670
      Phone: 800-237-9773     Phone: 800-237-9773
      Fax: 800-200-4397     Fax: 800-200-4397
   2. Or approved equal.

2.2 MATERIALS

A. Steel pipes, plate, angles, channels, beams, bars and other hot-rolled Sections: ASTM A36.

B. Bolts: ASTM A325; a563 nuts.

C. Fry Reglet Reveals and Moldings:
1. Reveal: Reveal Channel Screed DCS-625-50
   a. Reveal Finish: Anodized Aluminum
2. Molding: L Trim Molding DRML-625
   a. Molding Finish: Paint to match adjacent wall, as per the Design Documents.

2.3 PAINTING
A. Remove oil, grease and similar contaminants in accordance with SSPC SP-1 “Solvent Cleaning”, prior to any additional surface preparation specified.
B. Immediately after surface preparation, paint as per Painting Section.

PART 3 - EXECUTION
3.1 PREPARATION
A. Coordinate and furnish anchorages, shop drawings, diagrams, instructions, and directions for installation of anchorages, such as inserts, sleeves, anchor bolts and miscellaneous items having integral anchors.

3.2 INSTALLATION
A. Fastening to Construction: See details on drawings.

3.3 CONNECTIONS
A. Other connections: Fillet welds; grind smooth, where exposed.
B. Field Welding: Comply with AWS for procedures of welding, appearance and quality of welds made, and methods used in correcting welding work.
C. Coordination: Coordinate and schedule this work with the work of other trades. Provide soffit clips on stringers required for securing other work, so as to achieve the proper fire rating.

END OF SECTION 05 71 00
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions shall apply to the Work of this section.

1.2 DESCRIPTION OF WORK

A. Provide rough carpentry Work as indicated on the Drawings, as required for the completed Work of this Contract, and as specified herein, including, but not limited to, the following:

1. Wood Grounds, nailing strips, blocking, furring, nailers, and framing.
2. Rough hardware, including nails, screws, anchors, brackets, braces, bolts, nuts, fittings, and other devices required for the proper fitting, connecting, and erecting of the Work.
3. Fire-retardant treatment for wood.
4. Miscellaneous Lumber and plywood.

1.3 REFERENCES

A. U.S. Department of Commerce.
B. American Plywood Association (APA).
C. Western Wood Product Association (WWPA).
D. Southern Pine Inspection Bureau (SPIB).
E. Redwood Inspection Service (RIS).
F. American Wood Preservers' Association (AWPA).
H. Underwriters Laboratories, Inc. (UL).
I. Federal Specifications (FS).
J. American Lumber Standards Committee (ALSC).
K. West Coast Lumber Inspection Bureau (WCLIB).
L. American Wood Preservers Bureau (AWPB).
M. National Fire Protection Association (NFPA).

1.4 SUBMITTALS

A. Quality Control Submittals
   1. Certificates: Certification for the following wood treatments:
a. Dip Treatment: Certification by treating plant stating chemical solutions used, submersion period, and conformance with applicable standards.
b. Pressure Treatment: Certification by treating plant stating chemicals and process used, net amount of chemical preservative retained, and conformance with specified standards.
c. Waterborne Preservatives: Certified written statement that moisture content of treated materials was reduced to a maximum of 19 percent prior to shipment to Project site.
d. Fire-Retardant Treatment: Certification by treating plant stating treated material complies with specified standards and treatment will not bleed through specified finishes.

1.5 QUALITY ASSURANCE

A. Mill and Producers Mark
   Each piece of lumber and plywood shall be gradestamped indicating type, grade, mill, and grading agency certified by the Board of Review of the American Lumber Standards Committee. Mark shall appear on unfinished surface, or ends of pieces with finished surfaces.
   1. Fire-Retardant Treated Material: Accredited testing agency mark on each piece of wood indicating compliance with the fire hazard classification.

B. Standards
   Comply with the following unless otherwise specified or indicated on the Drawings:
   2. Plywood: Product Standard PS 1 for Softwood Plywood, Construction and Industrial by the U.S. Department of Commerce.
   4. Grading Rules:
      a. Douglas Fir, Hem-Fir, Idaho White Pine, and other Western Woods: Western Wood Products Association (WWPA) or West Coast Lumber Inspection Bureau (WCLIB).
      b. Southern Pine: Southern Pine Inspection Bureau (SPIB).
      c. Redwood: Redwood Inspection Service (RIS).

1.6 DELIVERY, STORAGE, AND HANDLING

ROUGH CARPENTRY 06 10 00 - 2
A. Keep materials dry during delivery. Store materials 6" minimum above ground surface. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation between stacks.
B. Cover stored materials until ready for use for protection from moisture. Place and anchor covering in a manner which will assure good ventilation under the covering.

1.7 PROJECT CONDITIONS

A. Correlate location of supporting members to allow proper attachment of other Work.

PART 2 - PRODUCT

2.1 LUMBER

A. General:
Furnish seasoned dimensional lumber dressed to nominal sizes indicated with 19 percent maximum moisture content at time of dressing, marked "S-DRY". Comply with dry size requirements of PS 20.
1. Dress: Surfaced 4 sides (S4S) unless otherwise indicated.
B. Miscellaneous Lumber:
Standard grade, No. 3 grade, or better grade of the following species unless otherwise indicated:
2. Furring: Douglas Fir or Southern Pine.

2.2 MISCELLANEOUS MATERIALS

A. Adhesive:
APA Specification AFG-01.

2.3 FIRE-RETARDANT TREATMENT

A. All lumber is to be fire-retardant treated, provide "FR-S" lumber, complying with AWPA Standards for pressure impregnation with fire-retardant chemicals to achieve a flamespread rating of 25 or less, when tested in accordance with UL Test 723, ASTM E84 or NFPA Test 255.
1. Provide UL label or identifying mark on each piece of fire-retardant lumber.
2. Redry treated items to a maximum moisture content of 19 percent after treatment.
B. Fire-retardant Treated Plywood:
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
Examine substrate and supporting structure on which rough carpentry is to be installed for defects that will adversely affect the execution and quality of the Work. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION - GENERAL

A. Do not use units of material with defects which impair the quality of the Work and units, which are too small to fabricate the Work with minimum joints or with optimum joint arrangement.
B. Install Work accurately to required lines and levels with members plumb and true, accurately cut and fitted and securely fastened. Closely fit rough carpentry to other associated construction.
C. Securely attach carpentry Work to substrates by anchoring and fastening as indicated, or, if not indicated, as required by the referenced standards. Select fasteners of size that will not penetrate through members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required. Set nail heads in exposed Work which is to be painted or stained and fill resulting holes.
D. Fire-retardant Wood
Do not rip or mill; only end cuts, drilling holes and joining cuts shall be permitted.

3.3 WOOD NAILERS, BLOCKING, AND GROUNDS

A. Install required items where indicated and where required for support, attachment or screeding of other Work. Form to shapes indicated or required. Coordinate locations and cut and shim as required to provide items at true and level planes to receive Work to be attached. Install closure strips to nailers at all edges.
1. Attach to substrates as indicated; if not indicated, size and space fasteners as required to support applied loading. Maximum spacing of fasteners shall not exceed 16".

3.4 PLYWOOD APPLICATIONS
A. Comply with printed installation requirements of the APA Design Construction Guide for plywood application unless otherwise noted.

3.5 ROUGH HARDWARE

A. Furnish all rough hardware, such as nails, bolts, clips, and all other rough hardware required to secure the carpentry work in place, unless otherwise specified.

END OF SECTION 06 10 00
SECTION 06 10 53 - WOOD NAILERS AND BLOCKING

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Non-Load Bearing Framing and Furring: Section 09 22 13

1.02 QUALITY ASSURANCE

A. Mill and Producer’s Stamp: Each piece of lumber shall bear a stamp indicating type, grade, mill, and grading agency.

1. Pressure treated wood shall bear a stamp or tag indicating the name of the treating company, year treated, preservative used, the level of treatment, intended use (appropriate AWPA Standard), and logo of inspecting company.

1.03 STORAGE

A. Store lumber a minimum of 6 inches off the ground, in a dry, well-ventilated place, protected from the weather.

PART 2   PRODUCTS

2.01 MATERIALS

A. Lumber: “Standard” Grade Douglas Fir, Hem-Fir, White Pine, Southern Pine, or Spruce-Pine-Fir pressure preservative treated in accordance with the American Wood Preservers Association (AWPA) Standard U1, Commodity Specification A for the requirements listed under Use Category UC2 and kiln dried to 19 percent moisture content after treatment.

1. Use Category UCFA and UCFB: Wood nailers and blocking intended for fire protection and is used in either interior weather protected (UCFA) or exterior construction, exposed to weather (UCFB).

B. Nails, Screws, and Bolts: ASTM A653 Class G185 hot dipped galvanized, zinc or cadmium plated, or silicon bronze.

1. Screws and Bolts for fastening to Aluminum: Stainless steel, Type 304 or 316.

C. Expansion Anchors: G185 Hot dipped galvanized steel wedge anchors, FS FF-S-325, Group II, Type 4, Class 1.

D. Toggle Bolts: Cadmium or zinc plated tumble - wing type; FS FF-588.

F. Separation Membrane For Aluminum Metals: Self adhering, self sealing, rubberized asphalt sheet membrane.
   1. Physical Properties:
      a. Thickness: 40 mils minimum ASTM D 3767 Method A.
      c. Elongation (ultimate failure of the rubberized asphalt) 250% ASTM D 412 Die C Modified).
      d. Permeance: 0.05 Perms max.) ASTM E 96.
   2. “Ice And Water Shield” by W.R. Grace Co., 62 Whittemore Ave., Cambridge, MA 02140, (800) 354-5414; “Deck Guard” by Polyguard Products Inc., P.O. Box 755, Ennis, TX 75120, (800) 541-4994; “MetalSeal” by NEI Advanced Composite Technology, 50 Pine Road, Brentwood, NH, (800) 998-4634.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install nailers and blocking true to line and plane within a tolerance of 1/8 inch in 10 feet.

B. Fit joints neatly with no more than 1/16 inch space between abutting members.

C. Do not install nailers or blocking across bonding expansion joints.

D. Attach nailers and blocking securely as required to properly support the items that will be attached to them.

E. Space fasteners equally at not more than 16 inches on center and 4 inches from each end of each member, unless noted otherwise. Secure the nailers and blocking with the following types of fasteners:
   1. To Cast-In-Place Concrete, Solid Concrete Masonry Units, and Brick: Use expansion anchors or self-threading masonry screws.
   2. To Faces of Hollow Concrete Masonry Units: Use toggle bolts.
   3. To Tops of Hollow Concrete Masonry Units: Use anchor bolts extending to course below, embedded in 3000 psi concrete filled cores.
   4. To Wood: Use nails or screws.
   5. To Metal: Use bolts or self-tapping screws.

F. Countersink fasteners if they interfere with the proper installation of items to be attached to the nailers and blocking.

END OF SECTION
PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Selective Removals & Demolition: Section 02 41 13.

1.02 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for each type of insulation specified.
   1. Include data substantiating that the materials comply with the specified thermal resistance and sound attenuation qualities.

1.03 QUALITY ASSURANCE

A. Allowable Thickness Variations: Manufacturer’s standard units which vary slightly from the thickness indicated may be acceptable, subject to the approval of the Director.

B. Thermal Resistance: The thicknesses shown are for the thermal resistance (R-Value in accordance with ASTM C 177 or ASTM C 518) specified for each material. The R-Values specified are minimum acceptable. Provide adjusted thicknesses as directed for the use of material having a different thermal resistance.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Do not allow insulation materials to become wet or soiled, or covered with ice or snow. Comply with manufacturer’s recommendations for handling, storage, and protection during installation.

C. Protect insulation materials subject to deterioration by sunlight from exposure to sunlight.

D. Complete the installation and concealment of insulation materials as rapidly as possible.

1.05 PROJECT CONDITIONS

A. Do not proceed with the installation of insulation on walls or under slabs until the Work which follows (and which conceals the insulation) is ready to be performed.
B. Examination of Substrate: Examine the substrate and the conditions under which the insulation Work is to be performed. Do not proceed with the insulation Work until unsatisfactory conditions have been corrected.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mineral Fiber Blanket or Batt (ASTM C665)
   1. Foil-backed insulation: Type III, Class A. Density: 3 lbs./cubic foot minimum.
   2. Blanket and batt insulation units shall be manufactured with a minimum of 20% of pre-consumer content materials.
   3. Fungi Resistance: Insulation and facing shall be fungi resistant when tested in accordance with ASTM C1338-00

B. Adhesive for Bonding Insulation: The type recommended by the insulation manufacturer

C. Anchors: Type and size shown or, if not shown, as recommended by the insulation manufacturer for the type of application shown and condition of substrate.

PART 3 EXECUTION

3.01 PREPARATION

A. Verify that adjacent materials are dry and ready to receive insulation.

3.02 INSTALLATION

A. Replace building insulation in like and kind at all locations wherever existing insulation was removed to facilitate the selective demolition work and the new construction.

B. Comply with manufacturer’s printed instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer’s technical representative for specific recommendations before proceeding with the work.
C. Extend insulation full thickness over entire surface to be insulated. Apply a single layer of insulation of the required thickness, unless otherwise indicated or required to make up the total thickness. Cut and fit tightly around obstructions, and fill voids with insulation.
1. Do not place insulation over, or within 3 inches of recessed lighting fixtures.

END OF SECTION 07 21 00
SECTION 07 81 00 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Statement of Special Inspections: BDC 406.

1.2 DEFINITIONS

A. Fireproofing Manufacturer: Manufacturer of primary fire resistive materials.


1.3 PERFORMANCE REQUIREMENTS

A. Fire Resistance Rating: Fireproofing shall meet the indicated hourly rating when applied to the construction assembly shown on the Drawings.

B. Fire Hazard Classification: Fireproofing shall be listed in the Underwriters Laboratories Building Materials Directory with the following performance properties:
   1. Flame Spread: 10 or less.
   2. Smoke Developed: 5 or less.

1.4 SUBMITTALS

A. Product Data: Manufacturer’s product descriptions for each required material.
   1. Fireproofing: Include fireproofing manufacturer’s application instructions, including primer/adhesive requirements and recommended minimum thickness and density for each required hourly rating.

B. Quality Control Submittals:
   1. Certificates:
      a. UL fire resistance rating certificate.
      b. UL fire hazard classification certificate.
      c. Fireproofing manufacturer’s certification (or confirming independent test reports) that fireproofing meets the performance requirements and physical properties.
2. Applicators Qualifications Data: Information confirming that the firm, supervisor, and workers have the specified qualifications.

1. 5 QUALITY ASSURANCE

A. Applicators Qualifications:
1. Firm: Approved by fireproofing manufacturer.
2. Supervisor: Not less than 5 years of experience in the application of sprayed fire resistive material.
3. Workers: Not less than one year of experience in the application of sprayed fire resistive material.

B. Fireproofing: Fire resistive materials free of all forms of asbestos, formulated for sprayed-on application, factory packaged, and complying with specified performance requirements and physical properties.
1. Source Limitations: Obtain fireproofing materials through one source from a single manufacturer.

C. Equipment: Use mixing and application equipment recommended by the fireproofing manufacturer.

D. Fireproofing Certifications:
1. UL fire resistance rating certificate.
2. UL fire hazard classification certificate.
3. Affidavit by fireproofing manufacturer (or confirming independent test reports) certifying that fireproofing meets the performance requirements and physical properties.

E. Field Examples
1. Do not proceed with the fireproofing in other areas until a field example has been approved by the College’s Representative.
2. Approved field example shall serve as the standard of quality for the remainder of the Work. Completely remove disapproved field examples.

1. 6 DELIVERY, STORAGE, AND HANDLING

A. Deliver fireproofing materials in factory packaged and sealed containers, clearly labeled, bearing manufacturer’s name, product name, product type, batch number, date, and UL labels for classifications.
B. Store materials in an enclosed area protected from the elements, and maintain within the manufacturer’s recommended temperature limits.

C. Handle materials in accordance with manufacturer’s printed instructions.

1.7 PROJECT CONDITIONS

A. Apply fireproofing prior to installation of ductwork, piping, conduits, and other suspended items. However, hangers, clips and other supports for these items shall be installed before application of fireproofing.

PART 2 - PRODUCTS

2.1 TYPE 1 FIREPROOFING

A. Use: Interior.

B. Physical Properties:
   2. Cohesion/Adhesion (Bond Strength) (ASTM E 736): Minimum average 200 lb/sq ft.
   5. Effect of Deflection (ASTM E 759): Shall not crack or delaminate.
   7. Air Erosion (ASTM E 859): Maximum 0.025 g/sq ft weight loss.

2.5 ACCESSORIES

A. Primer/Adhesive: Primer or adhesive recommended by the fireproofing manufacturer to obtain required bond strength for the specific fireproofing and substrate.

B. Sealer/Topcoat: Surface sealer and/or protective topcoat, as specified; materials as recommended by the fireproofing manufacturer for the intended use and conditions unless otherwise indicated.

C. Water: Potable, cool, fresh, and free from such amounts of organic and mineral substances which would be harmful to the fireproofing.
D. Sealant: Sealant recommended by the fireproofing manufacturer for the specific fireproofing use/application and substrate.

PART 3 - EXECUTION

3. 1 EXAMINATION

A. Verification of Conditions: Examine the substrate and conditions under which fireproofing is to be applied. Do not proceed with the fireproofing Work until unsatisfactory conditions have been corrected.
   1. Verify that hangers, clips, sleeves, and other items that will penetrate the fireproofing are in place.
   2. Check paint on substrate for compatibility with primer/fireproofing and adequacy of bond strength in accordance with fireproofing manufacturer’s instructions.

3. 2 PREPARATION

A. Protection:
   1. Protect surfaces that are not to receive fireproofing with suitable covers.
   2. Cover openings in the work areas with suitable temporary closures.

B. Surface Preparation:
   1. Remove dirt, dust, oil, grease, loose paint and rust, mill scale, and other foreign matter that may impair the bonding of the fireproofing to the substrate. Clean substrate free of contamination from chemicals and solvents.

3. 3 APPLICATION

A. Apply the fireproofing in accordance with UL fire test report and the manufacturer’s application instructions.
   1. Application Method: Apply the fireproofing material by spraying.

B. Thickness and density of fireproofing shall be in accordance with the approved product data and as required to produce the hourly fire resistance rating shown on the Drawings.

C. Apply the fireproofing in a monolithic covering of uniform density and texture, free of seams, staging breaks, holes, voids, and other defects that
might impair the fire resistance. Install the fireproofing to the full required thickness over entire area of each surface to be covered.
1. Stop-off application operation at natural stopping points, such as inside corners, wherever possible.
2. Edge of fireproofing adjoining other materials shall be sharp and clean, without overlapping.

D. Finish of Fireproofing: Unless otherwise indicated, finish shall be a uniform surface texture as applied, without noticeable icicles or sagging.

E. Sealer or Topcoat: Apply sealer or topcoat on surfaces of fireproofing in accordance with the fireproofing manufacturer’s application instructions.

F. Sealer and Topcoat: Apply sealer and topcoat on surfaces of fireproofing in accordance with the fireproofing manufacturer’s application instructions.

3.4 FIELD QUALITY CONTROL

A. Special Inspections and Testing Agency: The College will engage a qualified special inspections and testing agency to perform special inspections, tests, and prepare reports. The special inspections and testing agency will interpret the tests and indicate in each report whether the tested work complies with or deviates from project requirements. The special inspections and testing agency will perform tests in accordance with the New York State Uniform Fire Prevention and Building Code (BCNYS).

3.5 ADJUSTING

A. Correct fireproofing in damaged areas, and areas with less than the required thickness or standard of quality.

3.6 CLEANING

A. After completion of the fireproofing in each containable area of the project, remove protective covers and temporary closures, and clean surfaces that have been soiled performing the Work.

END OF SECTION 07 81 00

APPLIED FIREPROOFING 07 81 00 - 5
PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Provide firestopping at all penetrations and juncture joints of fire-rated walls, floors and ceilings in accordance with the requirements of the NYC Building Code.

B. Firestopping shall be provided:
   1. At all penetrations through fire rated partitions and assemblies.

C. If exposed to view fire stopping shall be painted to match adjacent surface.

1.2 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
   1. American Society for Testing and Materials (ASTM)
   2. Underwriters Laboratories, Inc. (UL)
   3. National Fire Protection Association (NFPA)
   4. Warnock Hersey

1.3 DESIGN REQUIREMENTS

A. Technical Requirements
   1. Firestopping materials shall be UL Classified as "Fill, Void or Cavity Material" for use in Through-Penetration Firestop Systems.
   2. Firestop Systems shall provide a fire resistance rating at least equal to the hourly resistance rating of the fire-rated barrier and resist passage of smoke and other gases.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product information for each type of firestopping/smoke seal and assembly installed, including application instructions and specifications.

B. Quality Control Submittals
   1. Certificates
a. Furnish manufacturer's certification that materials meet or exceed specification requirements for each of the performance tests specified in Part 2. Provide testing certification.

b. Furnish applicator's certification that material has been completed as specified to meet fire resistance ratings, thickness requirements, and application requirements of the applicable assembly.

c. Furnish UL, BSA, MEA, or OTCR approval of material.

d. Furnish certificate stating each material is 100% asbestos free.

2. Contractor Qualifications

a. Provide proof of Manufacturer and Applicator qualifications specified under “Quality Assurance”.

C. Guarantee

1. Contractor and installer's installation guarantee.

1.5 QUALITY ASSURANCE

A. Qualifications

1. Manufacturer

   Company specializing in the manufacture of firestopping/smoke seal materials to be used in this Contract shall have a minimum of five years experience.

2. Installer: All firestopping Work shall be performed by a Subcontractor who will be acceptable to the firestopping manufacturer in the application of its products and systems and have a minimum of three years experience and shall have worked on at least two projects with similar quantities of materials used.

B. Regulatory Requirements

1. Building Code: Material and application shall meet the requirements for firestopping materials in accordance with the NYC Building Code.

2. Material must have UL or NYC BSA, MEA or OTCR approval for each assembly utilized. Comply with the following for firestopping that is required to be in compliance with BC 712 of the 2008 NYC Building Code:
   b. ASTM E814 - Fire Tests of Through Penetration Firestops.
   d. U.L. - Fire Resistance Directory; Through-Penetration Firestop Systems (XHEZ), and Fill, Void or Cavity Materials (XHHW).

C. Manufacturer's Certification

1. Manufacturer shall provide written certification stipulating that its products and systems used in this Project, if installed in accordance with the
manufacturer's recommendations, shall provide the firestopping specified in this Section, as indicated by its UL rating for that specific installation.

2. The certification shall not include either or both of the following statements, or variations thereof:
"Owner or User shall determine suitability of the product or system for its intended use and assume all risks and liabilities connected therewith" and, "Owner or User shall test application of product or system for its specific use".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packages bearing name of manufacturer, product identification, and the proper UL labels for fire hazard and fire-resistance classification.

B. Store materials off ground, under cover, and away from damp surfaces, keep dry.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Maintain air and substrate temperature at a minimum temperature of 50°F for 24 hours before, during, and for 24 hours after application of the material or as required by the product literature, which ever is more stringent. Contractor shall provide enclosures with heat to maintain temperatures.

1.8 GUARANTEE

A. Submit a guarantee, executed by the Contractor and co-signed by the installer, agreeing to repair/replace firestopping work performed under this Contract which has cracked, flaked, dusted excessively, peeled, or has separated or fallen from the substrate due to defective workmanship for a period of two (2) years from the date of substantial.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Hilti Construction Chemicals, Inc., Tulsa, OK.

B. The Carborundum Company, Niagara Falls, NY.

C. 3M Fire Protection Products, St. Paul, MN.

D. Bio Fireshield, Inc., Concord, MA.
2.2 MATERIALS

A. Grout and sealant systems, as well as integral firestopping sleeves and membranes, shall meet or exceed requirements as specified in Part 1 of this Section and shall be acceptable to the Architect.

B. Firestopping systems shall meet the requirements of ASTM E814, which include, but are not limited to, the following:
   1. Prevent flame pass-through.
   2. Restrict temperature to not exceed 325°F over ambient on side of assembly opposite flames.
   3. Provide a positive smoke seal.
   4. Withstand hose stream test with a minimum positive pressure differential of 0.01 inch (2.49 pa.)
   5. Provide an F rating of not less than the required fire rating of the wall penetrated.

C. Firestopping materials shall be asbestos-free, emit no toxic or combustible fumes and be capable of maintaining an effective barrier against flame, smoke, gas, and water in compliance with requirements of this Section.

D. Firestopping materials/systems shall be flexible to allow for normal movement of building structure and penetrating items(s) without affecting the adhesion or integrity of the system.

E. Firestopping materials shall not require hazardous waste disposal of used containers/packages.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine and confirm the compatibility of surfaces to receive firestopping materials. Verify that surfaces are sound, clean and dry and are ready to receive the firestopping.

B. Verify that penetration elements are properly located and securely fixed, with the proper space between the penetration element and surfaces of the opening.

3.2 PREPARATION

A. Protect adjacent surfaces and equipment from damage.

B. Clean surfaces of opening.

3.3 INSTALLATION

A. Install firestopping system in strict accordance with the manufacturer's instructions to obtain the fire-rating required at the specific location.

B. Provide escutcheons for piping at each side of penetration.

C. Paint firestopping to match walls and ceiling where exposed.

3.4 FIELD QUALITY CONTROL

A. Contractors Responsibility for Quality Control
   1. Inspect all installations to ensure that all work meets the requirements specified as the Work progresses.
   2. Do not cover firestopping work until it is accepted and approved.

3.5 CLEANING

A. Remove excess materials, droppings, and debris; remove excess materials from adjacent surfaces.

3.6 PROTECTION

A. Protect firestopping installations from damage until completion of all Project Work.

END OF SECTION 07 84 00
SECTION 07 92 00 – JOINT SEALANTS

PART 1 – GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Gypsum Board Assemblies Section 09 29 00

1.2 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for each product specified except miscellaneous materials.
B. Samples:
   1. Sealants: One pint or standard tube.
   2. Joint Fillers: 12 inch long section
   5. Bond Breaker Tape: 12 inch long section.

1.3 QUALITY ASSURANCE

A. Container Labels: Include manufacturer's name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable), and packaging date or batch number.

1.4 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Temperature: Follow manufacturer’s directions.
   2. Ventilation: Provide sufficient ventilation wherever sealants, primers, and other similar materials are installed in enclosed spaces. Follow manufacturer's recommendations.

B. Protection:
   1. Protect all surfaces adjacent to sealants with non-staining removable tape or other approved covering to prevent soiling or staining.
   2. Protect all other surfaces in the Work area with tarps, plastic sheets, or other approved coverings to prevent defacement from droppings.

PART 2 – PRODUCTS

2.1 SEALANTS

A. GE Silicone II paintable sealant for sound penetrations or approved equal.
B. USG Acoustical sealant or approved equal
C. Sealant for exterior glazing, GE Silicone based.

D. Sealant Colors: For exposed materials provide color as indicated or, if not indicated, as selected by the Architect from manufacturer's standard colors. For concealed materials, provide the natural color which has the best overall performance characteristics.

2.2 JOINT FILLERS


2.4 MISCELLENOUS MATERIALS

A. Joint Primer/Sealer/Conditioner: As recommended by the sealant manufacturer for the particular joint surface materials and conditions.

B. Backer Rod: Compressible rod stock of expanded, extruded polyethylene.

C. Bond Breaker Tape: Polyethylene or other plastic tape as recommended by the sealant manufacturer; non-bonding to sealant; self adhesive where applicable.

D. Cleaning Solvents: Oil free solvents as recommended by the sealant manufacturer. Do not use re-claimed solvents.

E. Masking Tape: Removable paper or fiber tape, self-adhesive, non-staining.

F. Provide setting blocks and spacing material at exteriors windows.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine all joint surfaces for conditions that may be detrimental to the performance of the completed Work. Do not proceed until satisfactory corrections have been made.

3.2 PREPARATION

A. Clean joint surfaces immediately before installation of sealant and other materials specified in this Section.
   1. Remove all loose materials, dirt, dust, rust, oils and other foreign matter that will impair the performance of materials installed under this Section.
   2. Remove protective coatings and similar materials from joint faces with manufacturer's recommended solvents.
   3. Do not limit cleaning of joint surfaces to solvent wiping. Use methods
such as grinding, acid etching or other approved and manufacturer's recommended means, if required, to clean the joint surfaces, assuring that the sealant materials will obtain positive and permanent adhesion.

B. Set joint fillers at proper depth and position as required for installation of bond breakers, backer rods, and sealants. Do not leave voids or gaps between the ends of joint filler units.

C. Priming Joint Surfaces:
   1. Prime joints if recommended by the manufacturer's printed instructions.
   2. Do not allow the primer/sealer to spill or migrate onto adjoining surfaces.

### 3.3 JOINT BACKING INSTALLATION

A. Install bond breaker tape in relaxed condition as it comes off the roll. Do not stretch the tape. Lap individual lengths.

B. Install backer rod of sufficient size to fill the joint width at all points in a compressed state. Compress backer rod at the widest part of the joint by a minimum of 25 percent. Do not cut or puncture the surface skin of the rod.

### 3.4 SEALANT INSTALLATION

A. Except as shown or specified otherwise, install sealants in accordance with the manufacturer's printed instructions.

B. Install sealants with ratchet hand gun or other approved mechanical gun. Where gun application is impractical, install sealant by knife.

C. If low temperature makes application difficult, preheat sealants using manufacturer's recommended heating equipment.

D. Finishing: Tool all vertical, non-sag sealants so as to compress the sealant, eliminating all air voids and providing a neat smoothly finished joint. Provide slightly concave joint surface, unless otherwise indicated or recommended by the manufacturer.
   1. Use tool wetting agents as recommended by the sealant manufacturer.

### 3.5 CLEANING

A. Immediately remove misapplied sealant and droppings from metal surfaces with solvents and wiping cloths. On other materials, remove misapplied sealant and droppings by methods and materials recommended in writing by the manufacturer of the sealant material.

B. After sealants are applied and before skin begins to form on sealant, remove all masking and other protection and clean up remaining defacement caused by the Work.
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. Standard and custom hollow metal doors and frames.
2. Louvers installed in hollow metal doors.
3. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
3. Division 08 Section "Door Hardware".
4. Division 09 Section "Interior Painting" for field painting hollow metal doors and frames.
5. Division 09 Section “Gypsum Board Assemblies”.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
8. ASTM E 413 - Classification for Rating Sound Insulation.
14. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
15. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40” above sill) or UL 10C.

1. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CECO Door Products.
2. Curries Company.
3. Steelcraft.
4. Or Equal
2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 STANDARD HOLLOW METAL DOORS

A. General: Provide 1-3/4” and 2 1/4" doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.

B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
   a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
4. Manufacturers Basis of Design:
   1. CECO Door Products Legion Series.
   2. Curries Company 707 Series.
   3. Or Equal.

2.4 STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

3. Fabricate frames with mitered or coped corners.
4. Fabricate frames, with the exception of slip-on drywall types, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.
5. Frames for Steel Doors: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
6. Frames for Borrowed Lights: Minimum 16 gauge (0.053-inch-1.3-mm-) thick steel sheet.
7. Manufacturers Basis of Design:
   
a. CECO Door Products BQ/BU/DQ/DU/BR/DR Series (Drywall Profile).
b. CECO Door Products SQ/SU/SR Series (Masonry Profile).
c. Curries Company C/CM/CG Series (Drywall Profile).
d. Curries Company M/G Series (Masonry Profile).

C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

2.6 FRAME ANCHORS

A. Jamb Anchors:
   
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.7 LOUVERS

A. Metal Louvers: Door manufacturer's standard metal louvers unless otherwise indicated.
   
1. Blade Type: Vision proof inverted V or inverted Y.

2.8 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

D. Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal door manufacturer's written instructions.

1. Factory Glazing: Factory install glazing in doors as indicated. Doors with factory installed glass to include all of the required glazing material.

2.9 ACCESSORIES

A. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.10 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.

2. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

   a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.

5. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.

6. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

7. Jamb Anchors: Provide number and spacing of anchors as follows:
   
   a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      1) Two anchors per jamb up to 60 inches high.
      2) Three anchors per jamb from 60 to 90 inches high.
      3) Four anchors per jamb from 90 to 120 inches high.
   
   b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      1) Three anchors per jamb up to 60 inches high.
      2) Four anchors per jamb from 60 to 90 inches high.
      3) Five anchors per jamb from 90 to 96 inches high.
      4) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

8. Door Silencers: Except on gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

   1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
   2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
   3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
   4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.
2.11 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

9. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

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

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured,
remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.

4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:
   a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
   b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
   c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08 11 13
SECTION 08 31 13 - ACCESS DOORS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

A. Provide glass reinforced gypsum (GRG) access door in gypsum drywall ceilings, complete with accessories, as specified herein.
B. Install access panels or doors as required for operation, maintenance and/or inspection of dampers, smoke/heat detectors, equipment, valves, controls, or other devices concealed behind finished surfaces, non-removable ceiling construction, and in pipe shafts.”
C. Provide non-insulated fire rated access door in front of existing recessed junction box, as specified herein, for walls only.

1.03 RELATED SECTIONS

A. Unit Masonry………………………………Section 04 01 42
B. Gypsum Board Assemblies………………...Section 09 29 00
C. Painting ……………………………………Section 09 91 00

1.04 REFERENCES

A. Underwriters Laboratories, Inc. (UL)
B. National Fire Protection Association (NFPA)
C. Warnock Hersey (WHI)

1.05 SUBMITTALS

A. Product Data: Submit manufacturer’s technical data and installation instruction for each type of access door assembly, including setting drawings, templates, instructions and direction for installation of anchorage devices.
B. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment, and indicate on submittal schedule.
C. Special Size Access Doors: Use where required or as indicated.
1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle access doors and frames as recommended by the Manufacturer, to protect the units from damage.

1.07 QUALITY ASSURANCE

A. Coordination: Furnish inserts and anchoring devices which must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Hollow Metal Access Doors, For Walls
   2. Nystrom Building Products, Minneapolis, MI 55413  
   3. Acudor Products Inc., Cedar Grove, NJ 07009

B. Glass Reinforced Gypsum (GRG) Access Doors, For GWB Ceiling
   1. Chicago Metallic Company

2.02 ACCESS DOORS: WALL

A. For Gypsum Wall Board
   1. Frames
      Minimum 16 gage steel.
      a. Gypsum Board Applications: Trim shall be galvanized drywall bead.
      b. 36”x24” with 2 latches.
   2. Flush Type Door Panel
      Minimum 16 gage steel.
      a. Hinges: Hinges shall be exposed. Continuous piano hinge.
      b. Finish: Prime coat of rust inhibitive electrostatic powder, baked white enamel.
      c. Doors shall have automatic closure, be self-latching, and contain an interior latch release.
   3. Latches
      a. Latches shall be spring loaded sliding bolt type, keyed paddle latch, all keyed alike.
      b. Door can be prepared for a rim cylinder lock.
2.03 ACCESS DOOR: DRYWALL CEILING

A. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
B. The access door panel is made from glass reinforced gypsum and installs and finishes in the same manner as drywall. The Access Door comes in 2 pieces – the frame is attached with drywall screws, then taped and finished using conventional drywall finishing techniques.

2.04 FABRICATION AND MANUFACTURE

A. Manufacture access door assemblies as integral units complete with all parts and ready for installation. Fabricate units of continuous welded steel construction unless otherwise indicated or specified. Grind welds smooth and flush with adjacent surfaces where applicable. Attachment devices shall be of size and type suitable to secure access doors to types of walls and ceilings being installed into.
1. Access doors or panels shall be as required for the device being serviced by the access door/panel.”

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install the access doors in accordance with the manufacturer’s printed installation instructions, except as shown or specified otherwise.
B. Coordinate access door installation with installation of supporting construction.
C. Set units accurately in position and securely attach to support with face panel plumb or level in relation to adjoining finish surface.

3.02 ADJUSTMENT

A. Adjust hardware and doors for proper operation.
B. Remove and replace panels and/or frames which are warped, bowed or otherwise damaged.

END OF SECTION 08 31 13
SECTION 08 71 00 – DOOR 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.

B. Door hardware includes, but is not necessarily limited to, the following:
   1. Mechanical door hardware.

C. Related Sections:
   1. Division 06 Section “Rough Carpentry”.
   2. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   5. NFPA 105 - Installation of Smoke Door Assemblies.

E. Standards: All hardware specified herein shall comply with the following industry standards:
   1. ANSI/BHMA Certified Product Standards - A156 Series
   2. UL10C – Positive Pressure Fire Tests of Door Assemblies

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.

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. Keying Schedule: Prepared under the supervision of the Owner’s Representative, and Architect, prepare schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required, by Owner and Architect. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

E. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.
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. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders 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.

C. 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 in good standing 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.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

D. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.

1. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated (if required).

E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:

1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:

   a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
   b. Door Closers: Comply with the following maximum opening-force requirements indicated:

      1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
      2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

DOOR HARDWARE 08 71 00 - 3
c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.

3. NFPA 101: Comply with the following for means of egress doors:
   a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
   b. Thresholds: Not more than 1/2 inch high.

4. Fire-Rated Door Assemblies: Provide door hardware for 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 NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
   a. Test Pressure: Positive pressure labeling.

F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

G. Keying Conference: Conduct keying conference with Owner’s Representative, and Architect to incorporate the following criteria into the final keying schedule document:
   1. Function of building, purpose of each area and degree of security required.
   2. Plans for existing and future key system expansion.
   3. Requirements for key control storage and software.
   4. Installation of permanent keys, cylinder cores and software.
   5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference with attendance by representatives of Supplier(s), Installer(s), Contractor(s), Owner’s Representative and Architect 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 hollow metal 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 (if required).
   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.

DOOR HARDWARE 08 71 00 - 4
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: Related Division 08 Sections: Steel 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.

1.7 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. 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. Twenty five years for concealed closure.

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.

B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

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.

   1. 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:

      a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
   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.

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”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   a. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Acceptable Manufacturers:
   a. Bommer Industries (BO).
   b. Hager Companies (HA).
   c. McKinney Products (MK).

2.3 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts and surface bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

1. Acceptable Manufacturers:
   a. Door Controls International (DC).
   b. Rockwood Manufacturing (RO).
   c. Trimco (TC).

2.4 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.

C. Cylinders: Original manufacturer cylinders complying with the following:
1. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. 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.
5. Keyway: Manufacturer’s Standard.

D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified cylinders employing a utility patented and restricted keyway requiring the use of patented controlled keys. Provide bump resistant, fixed core cylinders as standard with solid recessed cylinder collars. Cylinders are to be factory keyed where permanent keying records will be established and maintained.

1. Provide a 6 pin multi-level master key system comprised of patented controlled keys and security and high security cylinders operated by one (1) key of the highest level. Geographical exclusivity to be provided for all security and high security cylinders and UL437 certification where specified.
   a. Level 1 Cylinders: Provide utility patented controlled keyway cylinders that are furnished with patented keys available only from authorized distribution.

2. Acceptable Manufacturer:
   a. Sargent Manufacturing (SA) - Degree Series.
   b. Corbin Russwin (RU) – Access 3 Series.

E. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:

1. Master Key System: Cylinders are operated by a change key and a master key.
2. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
3. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
4. Existing System: Master key or grand master key locks to Owner's existing system.
5. Keyed Alike: Key all cylinders to same change key.

F. Key Quantity: Provide the following minimum number of keys:

1. Top Master Key: One (1)
2. Change Keys per Cylinder: Two (2)
3. Master Keys (per Master Key Group): Two (2)
4. Grand Master Keys (per Grand Master Key Group): Two (2)
5. Construction Keys (where required): Ten (10)
6. Construction Control Keys (where required): Two (2)
7. Permanent Control Keys (where required): Two (2)
G. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4” backset, 3/4” throw anti-friction stainless steel latchbolt, and a full 1” throw stainless steel bolt for deadbolt functions.

1. Acceptable Manufacturers:
   b. Sargent Manufacturing (SA) – 8200 Series.
   c. Schlage (SC) – L9000 Series.

B. Lock Trim Design: As specified in Hardware Sets.

2.6 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.

B. Standards: Comply with the following:

2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
4. Dustproof Strikes: BHMA A156.16.

2.7 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 including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. 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 physically handicapped, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
   a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
   b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
   c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
   d. Closers shall be concealed.

5. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.

B. Door Closers, Overhead Concealed (Heavy Duty): ANSI/BHMA 156.4 certified Grade 1 heavy duty door closers. Closers to have fully concealed body in the door and track assembly in the frame, with separate and independent valves for closing speed, latch speed, and backcheck adjustments.

1. Acceptable Manufacturers:
   a. LCN Closers (LC) - 3130 Series.

2.8 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/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 (if applicable).

1. Acceptable Manufacturers:
   a. Burns Manufacturing (BU).
   b. Hiawatha, Inc. (HI).
   c. Rockwood Manufacturing (RO).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified 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.

1. Acceptable Manufacturers:
   a. Rixson Door Controls (RF).
   b. Rockwood Manufacturing (RO).
   c. Sargent Manufacturing (SA).

2.9 ARCHITECTURAL SEALS

A. General: Thresholds, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous sound gasketing on interior doors where indicated.

B. 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 UBC 7-2, Fire Tests of Door Assemblies.

C. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.

D. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

E. Acceptable Manufacturers:
   1. Pemko Manufacturing (PE).
   2. Reese Enterprises, Inc. (RS).
2.10 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.

2.11 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA 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 ANSI/DHI A115 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 devices; 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:
2. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
3. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. 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.

D. Thresholds: Set thresholds for acoustical doors in full bed of sealant.

E. 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 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 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.

3.6 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, and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.
3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE

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.

B. Manufacturer’s Abbreviations:

1. MK - McKinney
2. 00 - Other
3. RO - Rockwood
4. RU - Corbin Russwin
5. RF - Rixson
6. LC - LCN Closers
7. PE – Pemko
8. ZE - Zero
9. ST - Stanley
10. VD - Von Duprin
Hardware Schedule

Doors: 1, 2, & 3

Set: 1.0

1 Electrified Hinges  CECB168-54  US26D ST
7 Hinges           CECB168        US26D ST
1 Flush Bolt       2849           US26D RO
1 Dust Proof Strike 570          US26D RO
1 Classroom Lock    ML2075        626   RU
                  NSM           C6    RU
1 Electric Strike   6211          US26D VD
1 Coordinator       2600 Series  Black RO
2 Concealed Closer  3133 BUMPER   AL    LC
1 Gasketing         S88BL         PE
1 Astragal          S772BL        PE

Notes
1. Door and frame to be prepped to accept owner supplied Sentrol 1076C-N Recess Contact.
2. Electrified strike to be connected to owner supplied HID MultiClass/Mag Stripe Reader
3. Cylinder to be IC 6-pin

END OF SECTION 08 71 00
1. 1 DESCRIPTION OF WORK

A. Provide all glass glazing Work as indicated on the Drawings and as specified herein, including, but not limited to the following:

1. Float Glass (tempered)

1. 2 REFERENCES

A. Glass Association of North America (GANA).

B. Underwriters Laboratories, Inc. (UL).

C. American National Standards Institute (ANSI).


1. 3 SUBMITTALS

A. Product Data: Manufacturer's specifications and installation and maintenance instructions for each type of glass specified herein:

B. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer’s permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

C. Samples: Submit, for verification purposes, 12” square sample for each type of glass indicated.

D. Compatibility and Adhesion Test Report: Submit statement from sealant manufacturer that glass and glazing materials have been tested for this job for compatibility and adhesion with glazing sealants and interpreting test results of material performance, including recommendations for primers and substrate preparation needed to obtain adhesion.

GLAZING 08 81 00-1
1.4 QUALITY ASSURANCE

A. Special Experience Requirements:
   1. Manufacturer's Qualifications: Provide glass and glazing produced by a manufacturer with not less than (5) five years successful experience in the fabrication of glazing of the type and quality required.
   2. Installer's Qualifications: Engage an Installer and craftsmen who have successfully completed (3) three glass and glazing projects similar in scope, materials and design to this project within the last (5) five years.

B. Glazing Standards: Comply with recommendations of Glass Association of North America (GANA) "Glazing Manual" and "Laminated Glass Design Guide," except where more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined.

C. Single Source for Glass: To ensure consistent quality of appearance and performance, provide materials produced by a single manufacturer or fabricator for each kind and condition of glass.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and to prevent damage to glass and glazing materials from moisture, temperature changes, direct exposure to sun, and from other causes.

1.6 PROJECT CONDITIONS

A. Environmental Requirements
   1. Comply with glazing materials manufacturer's written recommendations regarding environmental conditions under which glazing materials can be installed.

B. Glazing channel dimensions shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate glazing material thickness, with reasonable tolerances. Provide correct glass size for each opening, within the tolerances and necessary dimensions required.

GLAZING 08 81 00-2
1. 7  WARRANTY

A. Warranties shall be in addition to, and not a limitation of other rights the Owner may have under the contract document.

B. In addition to the Contractor's guarantee provided in the Agreement, the manufacturer shall furnish warranties to repair or replace defective glass and glazing materials or workmanship for a period of five (5) years after date of Substantial Completion, and longer where specified. Defects include, but are not limited to the following:

1. Glass breakage due to pressures up to specified values, thermal stress, manufacturing defects and damage to glass.
2. Spontaneous breakage of heat treated glass.
3. Loss of effective glass bite due to shifting of glass.
4. Loss of effective glass bearing on setting blocks due to shifting of glass and blocks.

C. The warranties shall include a provision that the period of such warranties shall commence with the College's final acceptance of all work covered under the Contract.

PART 2 - PRODUCTS

2. 1 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include but are not limited to the following:

1. PPG Industries, Inc.
2. Spectrum Glass Products, Inc
3. Guardian Industries Corp.

2. 2 GLASS

A. GLASS

1. General: All Glass shall be Clear Soda-Lime Float Glass. Glass for glazing shall comply with the provisions of ASTM C1036 Standard Specification for Flat Glass. Unless otherwise stated, glazing materials and installation shall comply with the provisions and recommendations...

2. Quality Control: All glass shall be manufactured and processed in a factory where the quality control procedures comply with ISO 9002 and are independently maintained.

3. Defects: The glass shall be cut clean, without edge faults such as feathered edges, shells or other imperfections. In all point-supported glass and with all toughened glass, all edges shall be ground to eliminate edge defects.

4. Manufacturing Tolerances - In general as set out by ASTM C1036 - Minimum Actual Glass Thickness for Nominal Specified Glass Thickness: Not less than those specified in ASTM E 1300 Table A4.1

5. Fabrication Tolerances:

<table>
<thead>
<tr>
<th>Thickness</th>
<th>&lt;1/4”</th>
<th>5/16 &amp; 3/8”</th>
<th>1/2” &amp; 5/8”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warp:</td>
<td>±0.196” per yard measured along straight edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any dim.</td>
<td>&lt; 3'-3&quot;</td>
<td>±0.04”</td>
<td>±0.08”</td>
</tr>
<tr>
<td>Any dim.</td>
<td>&gt; 3'-3&quot;</td>
<td>±0.04”</td>
<td>±0.08”</td>
</tr>
</tbody>
</table>

Squareness shall be measured by a comparison of diagonals.

Diagonals up to 78.74”: ±0.15”.
Diagonals over 78.74”: ±0.19”.
Edge straightness: ±0.036” per foot

All glass shall be prefabricated and delivered in the required sizes. No on-site cutting, nipping or drilling will be allowed.

B. Heat Strengthened and Fully Tempered Glass:

1. All heat strengthened and fully tempered glass shall be tempered on a roller hearth furnace eliminating tong marks and shall conform to ASTM 1048 and/or ANSI Z97.1 or BS 6206 Class A.

2. For fully tempered glass the surface compressive stress shall be demonstrated by differential surface refractometer (DSR) measurement to be controlled at works at greater than 14,500 psi (100 MPa). For heat strengthened glass the surface compressive stress shall be demonstrated to be between 5800-7250 psi (40-50 MPa). 100% heat soak testing shall be required for all fully tempered glass per DN 18516, Part 4.

3. Tempering periods and temperatures shall be in accordance with manufacturer's guidelines, which shall be verified with trial test plates to assess:

GLAZING 08 81 00-4
a. Specific heating times for different glass thickness,
b. Distortion levels,
c. Compressive stress levels.

4. The glass shall conform to the following requirements in the horizontal tempering process:

a. Maximum Bow: for glass thickness less than 1/4" ±0.5%
and for glass thickness greater than 1/4" ±0.15%
b. Roller Wave: ±0.0059” maximum depth
c. Edge dip: ± maximum 0.0098”

5. Tempered glass shall have edges flat ground with a small arris and shall be polished. Small shells and/or chips shall be ground out prior to tempering. Maximum chip/shell diameter shall not exceed 1/16”. Do not cut, drill, work, or permanently mark after tempering.

C. Glazing Accessories

1. General: Provide approved glazing accessories required for a complete installation, in accordance with ASTM C864. Submit details, including compatibility with adjacent components and sealants. Indicate sizes and locations on shop drawings. Glazing accessories, including spacers, setting blocks, wedges, and the like, shall comply with AS 1288, and the recommendations of the glass manufacturer or glazing system. Extruded profiles shall be smooth, of uniform dimensions, correctly selected for the conditions of use, and free from components likely to bleed, stain or detrimentally affect performance of the glazing. All products shall be of ultra-violet resistant grade. Products may be manufactured from EPDM (ethylene-propylene-diene monomer), DuPont "Neoprene", or approved equivalent.

2.3 GLAZING MATERIALS

A. For Channel glazing and for small lights:

1. Products: W.R. Meadows Solaply; Pecora's 60+ Unicrylic Acrylic; Tremco's Mono.

2. Type 1 Glazing Material: Acrylic Glazing Sealant; solvent-based, acrylic terpolymer, thermoplastic sealant; FS TT-S-00230, Type II,
Class B, 95 percent of solids acrylic; compounded specifically for glazing.

B. Setting Blocks: Neoprene, 70-90 durometer hardness, with proven compatibility with sealants used.

C. Spacers: Neoprene, 40-50 durometer hardness, with proven compatibility with glazing materials used.

D. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with glazing materials used, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

E. Cleaners, Primers and Sealers: Type recommended by glazing material manufacturer.

2.4 FABRICATION

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 recommendations of product manufacturer and referenced glazing standard as required to comply with system performance required.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used.

B. Inspect each piece of glass immediately before installation, and eliminate pieces which have observable damage or face imperfections.

C. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

3.2 INSTALLATION

A. Each installation shall withstand normal temperature changes and impact loading (for operating doors) without failure of any kind including loss or
breakage of glass, failure of sealants or gaskets to remain airtight, deterioration of glazing materials and other defects in the Work.

B. Install glass in accordance with the standards detailed in the "Glazing Manual" and the "Glazing Sealing Systems Manual" of the Flat Glass Marketing Association except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

C. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other process.

D. Install glazing materials in accordance with the manufacturer's printed instructions.

3. 3 GLAZING

A. Install setting blocks of proper size at quarter points of sill rabbet. If required to keep in place, set blocks in thin course of the heel-bead compound.

B. Provide spacers inside and out, and of proper size and spacing, for all glass sizes larger that 50 united inches, except where gaskets are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels) except as otherwise indicated, depending on light sizes, thickness and type of glass, and complying with manufacturer's recommendations.

D. Do not cut, seam, nip, or abrade glass which is tempered, heat strengthened, or coated.

E. Force glazing materials into channel to eliminate voids and to ensure complete "wetting" or bond of glazing material to glass and channel surfaces.

F. Tool exposed surfaces of glazing sealants and compounds to provide a substantial "wash" away from the glass. Install pressurized tapes and gaskets
to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.

G. All butt joints shall be sealed with clear silicone, unless otherwise indicated on the drawings.

3.4 CURE, PROTECTION AND CLEANING

A. Cure glazing materials in accordance with manufacturer's printed instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability.

B. Mark glazed openings immediately upon installation of glass by attaching crossed streamers to framing. Do not apply markers of any type to surfaces of glass.

C. Replace glass included in the Work which is broken, or otherwise damaged, from the time Work is started at the site until the date of physical completion.

D. Maintain glass in a reasonably clean condition until date of physical completion.

E. Clean and trim excess glazing material from the glass and stops or frames promptly after installation.

F. When directed, or just before the project is turned over to the Owner, remove dirt and other foreign material and wash and polish glass included in the Work on both sides.

3.5 GLAZING SCHEDULE

A. Non-Rated Glass Doors and Side Lites: Fully Tempered Laminated Safety Glass.

END OF SECTION 08 81 00
SECTION 08 87 16 – WINDOW FILM

PART 1 - GENERAL

1.1 SECTION INCLUDES

Specification for an optically clear glass shatter resistant and abrasive resistant window film which, when applied will help hold broken glass together and reduce the ultra-violet light that normally would enter through the window. This film is useful as a deterrent against Smash and Grab and Break and Entry events, windborne debris protection, and bomb blast mitigation. This application requires the film be used in conjunction with a factory provided caulking attachment system. The film shall be called 3M Safety S140 Safety and Security Window Film.

1.2 RELATED REQUIREMENTS

A. Section 08 11 13 – Hollow Metal Doors and Frames
B. Section 08 81 00 – Glazing

1.3 REFERENCE STANDARDS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

The 1985 American Society for Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals.

The American National Standards Institute (ANSI).

- ANSI Z97.1 Specification for Safety Glazing Material used in Buildings

American Society for Testing and Materials (ASTM):

1. ASTM E-308 Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System
2. ASTM E-903 Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres
4. ASTM D-1044 Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test)
5. ASTM D-2582 Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting


9. ASTM E-84 Standard Method of Test for Surface Burning Characteristics of Building Materials

10. ASTM D-1004 Standard Method of Test for Resistance of Transparent Plastics to Tearing (Graves Tear Test)

11. ASTM E-1886 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials


13. ASTM F-1642 Standard Method of Test for Glazing and Glazing Systems Subject to Airblast Loadings, as adapted by the U.S. Government GSA Test Standard Protocols


15. ASTM F -2912 Standard Specification for Glazing and Glazing Systems Subjected to Airblast


1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years’ experience.

1. Provide documentation that the adhesive used on the specified film is a Pressure Sensitive Adhesive (PSA).

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.

1. Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.
2. Provide a commercial building reference list of 5 properties where the installer has applied window film.

This list will include the following information:

a. Name of building.
b. The name and telephone number of a management contact.
c. Type of glass.
d. Type of film and/or film attachment system.
e. Amount of film and/or film attachment system installed.
f. Date of completion.

3. Provide a Glass Stress Analysis of the existing glass and proposed glass/film combination as recommended by the film manufacturer.

4. Provide an EFilm application analysis to determine available energy cost reduction and savings.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Follow Manufacturer's instructions for storage and handling.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.6 PROJECT CONDITIONS

Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.7 WARRANTY

A. The application shall be warranted by the film manufacturer (3M) for a period of 14 years in that the film will maintain solar reflective properties without cracking,
crazing, delaminating, peeling, or discoloration. In the event that the product is found to be defective under warranty, the film manufacturer (3M) will replace such quantity of the film proved to be defective and will additionally provide the removal and reapplication labor free of charge.

B. b) 8.2 The film manufacturer (3M) also warrants against glass failure due to thermal shock fracture of the glass window unit (maximum value $500 per window) provided the film is applied to recommended types of glass and the failure occurs within sixty (60) months from the start of application. Any glass failure must be reviewed by the film manufacturer (3M) prior to replacement.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

The Manufacturer will ensure proper quality control during production, shipping and inventory, clearly identify and label each film core with the product designation and run number.

The Manufacturer will, upon request and pre-approval, provide 100% financing for the complete installation of the window film to the end-user customer in either an installment purchase or lease purchase format to be decided upon by customer.

Materials shall be manufactured by:

A. Location: 3M Renewable Energy Division 3M Center, Building 235
   St. Paul, MN 55144-1000
   Point of Contact: John Susnik, Sunray
   Phone: 800-295-8468.
   Email: john@sunrayfilms.com.

B. Or Approved Equal.

2.2 CLEAR SAFETY AND SECURITY WINDOW FILM

A. 3M Safety S40 (SH4CLARL): Optically clear polyester film with a durable acrylic abrasion resistant coating over one surface and a pressure sensitive adhesive over the other. The adhesive is pressure-activated, not water-activated, and forms a physical bond, not chemical bond, to the glass.

1. Physical / Mechanical Performance Properties:
   a. Film Color: Clear.
   b. Thickness: Nominal 4.0 mils
   c. Tensile Strength (ASTM D 882): 25,000 psi.
2. Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.

3. Variation in Total Transmission across the Width: Less than 2 percent over the average at any portion along the length.

4. Identification: Labeled as to Manufacturer as listed in this Section.

5. Solar Performance Properties: Film applied to 1/4 Inch (6 mm) thick clear glass.
   b. Ultraviolet Transmission (ASTM E 903): Less than 1 percent.


2.3 PERFORMANCE REQUIREMENTS

A. FILM MATERIAL

The film material shall consist of three laminated film layers of optically clear polyester and contain a durable abrasion resistant coating over one surface, and a UV stabilized pressure sensitive adhesive on the other. The film shall have a nominal thickness of 14 mils (0.014 inches). The film shall be identified as to Manufacturer of Origin (hereafter to be called Manufacturer).

B. FILM PROPERTIES

Tensile Strength (ASTM D882): 25,000 psi
Break Strength (ASTM D882): 25,000 psi (350 lbs per inch width)
Percent Elongation at Break (ASTM D882): >125%
Percent Elongation at Yield (ASTM D882): greater than 100%

C. SOLAR PERFORMANCE PROPERTIES

Visible Light Transmission: 85%
Visible Reflection: not more than 10%
Ultraviolet Transmission: less than 1% (300 – 380 nm)
Solar Heat Gain Coefficient: 0.78
D. FLAMMABILITY

The Manufacturer shall provide independent test data showing that the window film shall meet the requirements of a Class A Interior Finish for Building Materials for both Flame Spread Index and Smoked Development Values per ASTM E-84.

E. ABRASION RESISTANCE

The Manufacturer shall provide independent test data showing that the film shall have a surface coating that is resistant to abrasion such that, less than 5% increase of transmitted light haze will result in accordance with ASTM D-1044 using 100 cycles, 500 grams weight, and the CS10F Calbrase Wheel.

F. ADHESIVE SYSTEM

The film shall be supplied with a high mass pressure sensitive weatherable acrylate adhesive applied uniformly over the surface opposite the abrasion resistant coated surface. The adhesive shall be essentially optically flat and shall meet the following criteria:

   a. It shall not be necessary to seal around the edges of the applied film system with a lacquer or other substance in order to prevent moisture or free water from penetrating under the film system.

G. IMPACT RESISTANCE FOR SAFETY GLAZING

The film, when applied to either side of the window glass, shall pass a 400-ft-lb impact when tested according to 16 CFR CPSC Part 1201 (Category 2) and ANSI Z97.1 (Class A, Unlimited).

H. WINDBORNE DEBRIS PROTECTION per ASTMs E1886/E1996

Film shall pass impact of Medium Large Missile “C” and withstand subsequent pressure cycling (per ASTMs E 1996 and E 1886) at 50 psf Design pressure with use of 3M Impact Protection Adhesive attachment system.

I. BOMB BLAST MITIGATION

GSA Rating of “3B” (Low Hazard) with minimum blast load of 10 psioverpressure and 89 psi*msec blast impulse.

J. BURGLARY RESISTANT GLAZING

Independent lab testing according to UL 972
Multiple Impact Test on ¼” annealed glass – PASS
Multiple Impact Test on ¼” tempered glass -- PASS

PART 3 - EXECUTION

3.1 EXAMINATION

Examine glass surfaces to receive new film and verify that they are free from defects and imperfections, which will affect the final appearance. Correct all such deficiencies before starting film application.

3.2 PREPARATION

A. The window and window framing will be cleaned thoroughly with a neutral cleaning solution. The inside surface of the window glass shall be scraped with stainless steel razor blades with clean, sharp edges to ensure the removal of any foreign contaminants without damages the glass surface.

B. Drop cloths or other absorbent material shall be placed on the windowsill or sash to absorb moisture accumulation generated by the film application.

3.3 INSTALLATION

A. FILM INSTALLATION:

1. Install in accordance with manufacturer's instructions.
2. Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) of window sealant. Use new blade tips after 3 to 4 cuts.
3. Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
4. Apply film to glass and lightly spray film with slip solution.
5. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
6. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
7. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

B. IMPACT PROTECTION ADHESIVE INSTALLATION:

1. The film attachment system shall be applied according to the specifications of the Manufacturer by an Authorized Dealer/Applicator. Refer to 3M
a. For blast hazard mitigation: minimum 1/2 inch bead overlap on both frame and film (excluding glazing stops or compression gaskets).
b. For impact resistance and building envelope protection: minimum 3/8 inch bead overlap on both frame and film (excluding glazing stops or compression gaskets).

2. To ensure a straight and consistent bead width is achieved, masking tape may be applied to film and frame surfaces prior to application.

3. With prior approval of the building owner or property manager, existing compression gaskets may be partially removed or trimmed to allow for a thinner bead and stronger anchorage. If removing the gaskets, sections shall be trimmed approximately 3 inches in length and inserted with appropriate spacing along all sides of the window to help secure the glazing during application and curing of the Impact Protection Adhesive.

4. The Impact Protection Adhesive shall be dispensed with a caulk gun with nozzle opening diameter sized to match the approximate size of the desired bead width.

5. A plastic putty knife or other tool with a clean straight edge shall be used to trowel and smooth out the adhesive. The completed adhesive bead shall be relatively triangular in shape.

6. Any masking tape used shall be carefully removed within 10 minutes after applying the wet glaze.

C. IMPACT PROTECTION PROFILE INSTALLATION:

1. The film attachment system shall be applied according to the specifications of the Manufacturer by an Authorized Dealer/Applicator trained to install 3M Impact Protection Profile. Refer to 3M publication, 3M Impact Protection Profile Installation Systems Instructions.

2. Each profile piece must span continuously to both sides of the window, within 1/8 inch to the frame edge. Splicing the profile between frame edges is prohibited.

3. Profile must be aligned and applied by 3M recommended or approved methods and tools to ensure a quality installation.

4. Corner joints must be fabricated by 3M recommended and approved methods. No part of the profile adhesive shall make contact with an adjacent profile.

5. Sufficient pressure must be evenly applied along the entire length of the profile to ensure full adhesion from both adhesive strips. A roller tool is required to minimize entrapment of air in the adhesive.

3.4 CLEANING

The film may be washed using common window cleaning solutions, including
ammonia solutions, 30 days after application. Abrasive type cleaning agents and bristle brushes, which could scratch the film, must not be used. Synthetic sponges or soft cloths are recommended.
SECTION 08 88 13 – FIRE RESISTANT GLAZING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fire-rated glazing materials installed at borrowed lights and within rated hollow metal doors.

1.2 RELATED REQUIREMENTS

A. Section 08 11 13 – Hollow Metal Doors and Frames, Borrowed Lights.
B. Section 09 29 00 - Gypsum Board Assemblies.

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):
B. American National Standards Institute (ANSI):
   1. ANSI Z97.1 - For Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2009
C. Consumer Product Safety Commission (CPSC):
D. Glass Association of North America (GANA):
   1. GANA - Glazing Manual; 2008
   2. GANA - Sealant Manual; 2008
E. National Fire Protection Association (NFPA):
   1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2010
F. Underwriters Laboratories, Inc. (UL):
   1. UL 9 – Standard for Fire Tests of Window Assemblies; 2009
   2. UL 10B – Standard for Fire Tests of Door Assemblies; 2008
   3. UL10C – Standard for Positive Pressure Fire Tests of Door Assemblies; 2009
1.4 DEFINITIONS

A. Fire Protection: As defined by the International Building Code (IBC), fire protection glass has fire rating of 45 or 90 minutes and is in compliance with NFPA 252, NFPA 257, UL 9, UL 10B, and UL 10C testing standards.

B. Fire Resistance: As defined by the International Building Code (IBC), fire resistant glass has fire rating of 60 or 120 minutes and is in compliance with ASTM E119, NFPA 251, NFPA 252, NFPA 257, UL 9, UL 10B, UL 263, and CAN/ULC-S101 testing standards.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer’s technical data for each glazing material indicated, including installation and maintenance instructions.

B. Certificates: Submit from glass and glazing materials manufacturer verifying that glass and glazing materials furnished for project comply with requirements.
   1. Certification submittals are not required for glazing materials bearing manufacturer’s permanent label that designate type and thickness of glass, and labels represent a quality control program from recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.

C. Product Test Listings: Submit UL listing, indicating that fire-resistant glass complies with requirements based on comprehensive testing of products indicated.

D. Samples: Submit, for verification purposes, 8 inch by 8 inch size samples for each type of glass indicated.

E. Warranty: Submit sample of manufacturer’s warranty.

1.6 QUALITY ASSURANCE

A. Glazing Standards: GANA Glazing and Sealant Manuals

B. Fire Resistance Rated Glass: Each lite shall bear permanent, non-removable UL label certifying it for use in tested and rated fire resistive assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Coordinate with hollow metal doors and borrowed lights.

B. Deliver material to designated location on project site in manufacturer’s original packaging, undamaged, and complete with installation instructions.

C. Do not expose fire-resistant glazing to temperatures greater than 120 degrees F or less than minus 40 degrees F during storage and transportation, as well as installation.

D. Store in dry conditions, evenly supported along full length of edge, off ground, under cover, and protected from weather and construction activities.
E. Do not expose non-polyvinyl butyral (PVB) side of glass to ultra violet light.

F. Do not leave glass temporarily held in frames without fixing of glazing beads and completion of capping silicone sealant.

G. Store sheets of glass vertically, do not lean glass against surfaces for support, ensure maximum of 6 degree declination from vertical.

1.8 WARRANTY

A. Provide manufacturer's limited warranty subject to requirements of proper handling and installation requirements, and if properly installed in fire rated support system, approved by independent testing laboratory as follows:
   1. Manufacturer will meet published fire-resistant glass requirements.
   2. Manufacturer’s insulating glass units will not develop material obstruction of vision between interior glass surfaces due to manufacturing defects.
   3. Fire ratings indicated will not be degraded due to manufacturing defects.

B. Warranty Period: For period of five years commencing the date of original factory shipment of glazing materials to project site by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. SAFTI FIRST Fire Rated Glazing Solutions:
   www.safti.com
   1. Location: Brisbane, CA
   2. Phone: (888) 653-3333

B. Pilkington Fire Protection Glass North America; Product Pyrostop:
   www.pilkington.com/fire
   1. Pilkington North America, Inc.
   2. Location: Toledo, Ohio.
   3. Phone: (419) 478-0165.
   4. Fax: (419) 478-0165.

C. Distributed by Technical Glass Products, Snoqualmie, Washington:
   www.fireglass.com
   1. Phone: (800) 426-0279.
   2. Fax: (800) 451-9857.
   3. Email: sales@fireglass.com.

D. Approved equal.

2.2 PERFORMANCE REQUIREMENTS

A. Clear, laminated, fully insulating fire-resistant safety glass for use in impact safety-rated locations such as doors, sidelites, and wall applications with fire
rating requirements ranging from 45 to 120 minutes and passing hose stream test; for use in interior applications.

B. Fire-resistant glazing provides protection by effectively blocking radiant and conductive heat, and maximizing natural light and visibility.

C. Passes positive pressure test standard; UL 10C.

2.3 GLAZING MATERIALS

A. Composition: For fire ratings equal to or greater than 45 minutes, glazing is composed of multiple sheets of high visibility light transmitting glass laminated together using intumescent type interlayers.

B. Permanently label each piece of fire-resistant glazing with UL control number, product and manufacturer’s name, hourly fire rating, and human impact safety rating.


D. Glazing assemblies for 45 minute and above fire rated assemblies are composed of the following glass:
   1. Product: Optiwhite™ low iron glass as manufactured by Pilkington

E. Interior Use Fire Resistant Glazing Properties
   1. Glazing Type: 45-200 (Door Glazing)
      a. Fire Rating: 45 minutes
      b. Glass Thickness: 3/4 inch (19 mm)
      c. Daylight Transmission: 86 percent
      d. Weight: 9.2 lbs per sq ft
      e. STC: 40 dB
      f. Assembly: Doors
         1) Maximum Exposed Area: 3,724 sq in
         2) Maximum Exposed Width: 41 5/8 inch
         3) Maximum Exposed Height: 89 3/4 inch
      g. Building Code Marking: DOH-N-45

   2. Glazing Type 60-101 (Borrowed Lights)
      a. Fire Rating: 60 minutes
      b. Glass Thickness: 7/8 inch
      c. Daylight Transmission: 87 Percent
      d. Weight: 10.6 lbs per sq ft
      e. STC: 41 dB
      f. Assemblies: Sidelites
         1) Maximum Exposed Area: 5,605 sq in
         2) Maximum Exposed Width: 96 inch
         3) Maximum Exposed Height 95 inch
      g. Building code marking W-60

   2. Glazing Type SuperLite II-XLM 120
      a. Fire Rating: 120 Minute
b. Glass Thickness: 1-1/2 inch
   c. Daylight Transmission: 87 Percent
   d. Weight: 12 lbs per sq ft
   e. STC: 44 dB

2.4 GLAZING COMPOUNDS

A. Glazing Tape: Provide closed cell polyvinyl chloride foam that is coiled on release paper over adhesive on two sides with maximum water absorption of 2 percent by volume and compression of 25 percent to ensure air and vapor seal, and also non-combustible and flexible.

B. Silicone Sealant: Non-combustible, one-part neutral curing silicone, medium modulus sealant, in accordance with ASTM C920; Type S, Grade NS, Class 25 with additional movement capability of 50 percent in both extension and compression for total of 100 percent, Exposure NT, Substrates G, A, and O as applicable.

   1. Acceptable Manufacturers:
      a. Product; Dow Corning 795 Silicone Building Sealant manufactured by Dow Corning Corp.: www.dowcorning.com
      b. Product; SilGlaze II SCS2800 manufactured by Momentive Performance Materials: www.momentive.com
      c. Product; Spectrem 2 manufactured by Tremco Inc.: www.tremcosealants.com
      d. Substitutions: Not permitted.

C. Setting Blocks: Hardwood that is suitably treated against humidity or calcium silicate; sized to width of glass by 4 inches by 3/16 to 1/4 inches thick

D. Spacers: Neoprene or other resilient blocks of 40 to 50 Shore A durometer hardness, adhesive-backed on one face only, tested for compatibility with specified glazing compound.

E. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.5 FABRICATION

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 manufacturer recommendations and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:
1. Verify manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Verify for minimum required face or edge clearances.
3. Examine for edge damage or face imperfections.

B. Clean glazing channels and other framing members receiving glass immediately before glazing, and remove coatings that are not firmly bonded to substrates.

C. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with referenced GANA standards and manufacturer’s handling and installation instructions for glass, glazing sealants, and glazing compounds.
B. Protect glass edges and glazing tapes from damage during handling and installation.
C. Inspect glass during installation and report damaged glazing tape that could be detrimental to performance to manufacturer’s product representative.
D. Cut glazing tape to length and set against permanent stops, flush with sight lines and fitting openings exactly, and with allowance for stretch during installation.
E. Install setting blocks with edge block, located at quarter points of glass, no more than 6 inches from corners.
F. Install glazing vertically into fire-rated metal frames or partition walls with same fire rating as glass, and push against tape for full contact at perimeter of pane or unit.
G. Install glazing tape on free perimeter of glazing as indicated above.
H. Do not remove or tamper with special edge protection tape.
I. Do not allow direct contact between glass and framing material.
J. Install removable stop and secure without displacement of tape.
K. Do not put heavy pressure on glass through glazing beads, sealing profiles or glazing tapes.
L. Carefully trim protruding tape with sharp knife.
M. Apply cap bead of silicone sealant along void between the stop and the glazing, to uniform line, with bevel to form watershed away from glass, tool or wipe sealant surface smooth.
N. Provide at least 3/16 inch of edge clearance.
O. Install glazing in vision panels of fire-rated doors in compliance with NFPA 80.
P. Install glazing so that UL and manufacturer’s labels remain visible and oriented properly per instructions after installation.

3.3 TOLERANCES

A. Deflection: Designed deflection of insulating glass units in their frame under the maximum potential design load should be less than the span of glass unit in millimeters divided by 300, or 8 mm, whichever of these two numbers is least.
B. Glazing pressure on glass edges shall be low and uniform, less than 20 N per cm edge length at border of pane.

FIRE RESISTANT GLAZING 08 88 13 - 6
1. Point loading of glass edges is not permitted.

3.4 PROTECTION AND CLEANING

A. Protect glass from contact with contaminating substances resulting from construction operations.
   1. Remove any such substances by method approved by glass manufacturer.
B. Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of Substantial Completion.
   1. Wash glass by method recommended by glass manufacturer.

3.5 GLAZING GENERAL

A. Use methods approved by testing agencies that listed and labeled fire-resistant glazing products.
B. 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.
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 primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction 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.
F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
   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 (3-mm) 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 with proper orientation so that coatings face fire side or protected side as specified.

J. 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.

K. Square cut wedge-shaped gaskets at corners 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.

END OF SECTION 08 88 13
SECTION 09 22 13 - NON-LOAD BEARING FRAMING AND FURRING

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 Submittals

1.02 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for the following:
   1. Studs, Tracks, and Furring.
   2. Fasteners.

B. Samples:
   1. Steel Framing and Furring: 12 inches long, each component.
   2. Fasteners: 10 each type.

1.03 QUALITY ASSURANCE

A. Fire Resistance Rated Applications: Provide UL listed or ASTM E 119 tested materials, accessories, and application procedures to comply with the rating indicated.

PART 2 PRODUCTS

2.01 MATERIALS

A. Studs, Tracks, and Furring: ASTM C 645; 25 gage galvanized steel, with additional framing members, reinforcing, accessories, and anchors necessary for the complete framing system.

B. Fasteners: Except where shown or specified, select fasteners of type, size, style, grade, and class required for secure installation of framing and furring. Galvanize all fasteners and accessories.
   2. Lag Bolts: FS FF-B-561, square head.
   7. Toggle Bolts: Tumble-wing type; FSS FF-B-588, type, class and style as required to sustain load.
C. Anchors: Steel framing manufacturer's recommended types and sizes for substrates involved.

PART 3 EXECUTION

3.01 STEEL FRAMING AND FURRING INSTALLATION

A. Install steel framing, furring and accessories in accordance with manufacturer's printed instructions, unless otherwise shown or specified.

B. Framing Installation:
   1. Align tracks accurately at floor and ceiling. Secure tracks as recommended by the framing manufacturer for the upper and lower construction involved, except do not exceed 24 inches oc spacing for nail or powder-driven fasteners, or 16 inches oc for other types of attachment. Provide fasteners approximately 2 inches from corners and ends of tracks.
   2. Position studs vertically and engage both upper and lower tracks. Space studs 16 inches on center, unless otherwise indicated on the Drawings. Fasten studs to track flanges with screws or by crimping.
      a. Use full length studs between tracks wherever possible. If necessary, splice studs with a minimum 8 inch nested lap and fasten with two screws per stud flange.
   3. Install additional studs to support inside corners at intersections and corners, and to support outside corners, terminations of partitions, and both sides of control joints (if any).
   4. Terminate partitions at finish ceiling line unless otherwise indicated on the Drawings.
   5. Brace chase wall framing horizontally to opposite studs with 12 inch wide gypsum board gussets or metal framing braces, spaced vertically not more than 4 feet on center.
      a. Attach gypsum board gussets with a minimum 3 screws per stud flange.
      b. Attach metal framing braces with a minimum 2 screws per stud flange.

C. Steel Furring Installation: Install steel furring at 16 inches oc maximum spacing and provide additional furring at openings, cutouts, and corners. Securely anchor with fasteners spaced 24 inches oc maximum and stagger on opposite flanges of hat-shaped channels.

D. Tolerances: Do not exceed 1/8 inch in 8 feet variation from plumb or level in any exposed line or surface, except at joints between boards do not exceed 1/16 inch variation between planes or abutting edges or ends. Shim as required to comply with specified tolerances.
PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Work under this section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this section as shown on the drawings, as specified herein, and/or as specified by job conditions.

1.2 DESCRIPTION OF WORK

A. Provide materials, labor, equipment and services to complete all gypsum board installation including metal studs, regular, fire resistant, moisture resistant gypsum board, and all accessories as specified herein and as indicated on the Drawings.

B. This section includes gypsum wallboard assemblies which meet specified criteria for:
   1. Post-consumer recycled paper content in the gypsum wallboard paper facing; and
   2. Post-industrial recycled content (synthetic gypsum) in the gypsum wallboard cores (optional).

1.3 RELATED SECTIONS

A. Section 05 71 00 – Miscellaneous Metals

B. Section 06 10 00 – Rough Carpentry

C. Section 09 91 00 – Painting

1.4 QUALITY ASSURANCES

A. Codes and Regulations
   1. Work specified herein shall conform to all applicable State and Local codes and regulations having jurisdiction.
   2. Where fire resistant ratings are required for work of this section, the gypsum drywall assemblies shall be installed in strict accordance with the Underwriters Laboratory requirements.

B. Environmental Criteria for gypsum wallboard:
   1. Recycled Content:
      Gypsum wallboard shall contain recycled content material as follows:

GYPSUM BOARD ASSEMBLIES 09 29 00 - 1
a. Paper facings: a minimum of 100% post-consumer recycled paper content.
b. Gypsum cores: Where feasible, a minimum of 75% post-industrial recycled gypsum content (also called “synthetic” gypsum – from coal-fired power plants).

The percentage of recycled content is based on the weight of the component materials.

C. Environmental Criteria for Glass Fiber:
(for recycled content and other High Performance building criteria)
1. Recycled content:
   a. EPA Comprehensive Procurement Guidelines, www.epa.gov/cpg
   b. ASTM D5359, “Glass Cullet Recovered from Waste for Use in Manufacture of Glass Fiber”
   c. Fiberglass insulation shall contain a minimum of 20% (combined) post-industrial/post-consumer recycled content. The percentage of recycled content is based on the weight of the component materials.

2. Emissions:
   a. Where feasible, provide fiberglass insulation that does not contain formaldehyde binders.
   b. Fiberglass insulation in exposed locations and in ceiling plenums (used for HVAC return) shall be encapsulated with a continuous wrap of polyethylene or similar material.

1.5 SUBMITTALS

A. Product Literature
   1. Submit manufacturers' products literature, catalog cuts and data sheets for all products.

B. Gypsum wallboard:
   1. Manufacturer’s certification of recycled content per paragraph 1.04.
   3. Manufacturer’s maintenance instructions.
   4. Manufacturer’s policy statement on gypsum wallboard recycling programs.
   5. Samples of accessories, studs, attachments

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the site, ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to approved samples.
B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.

C. Gypsum wallboard to be stored per manufacturer’s recommendations for allowable temperature and humidity range. Panels shall not be allowed to become damp.

D. Where feasible, gypsum wallboard shall not be stored with materials which have high emissions of VOCs or other contaminants (see paragraph 3.03 below).

1.7 ENVIRONMENTAL REQUIREMENTS

A. During joint finishing, maintain within the work area a uniform temperature between 55 and 70 degrees F.

1.8 REGULATORY REQUIREMENTS

A. New York City Building Code

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering gypsum board systems which may be incorporated in the Work include but are not limited to the following:

1. Steel Framing and Furring:
   a. Bostwick Steel Framing Co.
   b. Gold Bond Building Products Division
   c. Marino Industries Corp.
   d. United States Gypsum Co.

2. Grid Suspension Systems:
   a. Chicago Metallic Corp.
   b. National Rolling Mills Co.
   c. United States Gypsum Co.

3. Gypsum Boards and Related Products:
   a. Georgia-Pacific Corp.
   b. National Gypsum Company
   c. United States Gypsum Co.

2.2 GYPSUM BOARD

A. See drawings
B. Provide 5/8” fire rated gypsum board at all rated walls.
C. Shaft wall where shown on drawings (if required).

### 2.3 FURRED AND STUD WALL FRAMING MEMBERS

**A. General:** Select size and gauge of framing members and establish spacing to comply with requirements of ASTM C 754 unless otherwise specifically indicated.

1. **Maximum deflection:** L/240 at 5 lbf per square foot, except limit deflection to L/360 where gypsum board partitions are substrates for ceramic tile.

**B. Metal studs:** as indicated on the drawings, non-load bearing channel or C-H type, formed from 20 gauge electro-galvanized steel, as per ASTM C-645 designed for screw attachment and provided with knockouts to accommodate pipe and/or conduit installations. Width and height of studs shall conform to partition types noted on the drawings. See drawing for additional gauges of studs.

**C. Ceiling and floor runners:** channel type formed of 20 gauge electro-galvanized steel, designed to receive partition types and studs as required. Stud, runners and furring shall conform to ASTM C-645.

### 2.5 FURRING CHANNELS

**A. Min. gauge 25 with hemmed edges**

### 2.6 JOINT TREATMENT

**A. General:** Provide products by manufacturer of gypsum boards. Comply with ASTM C 475 and with manufacturer’s recommendations for specific project conditions.

**B. Joint Tape:** Manufacturer’s standard paper reinforcing tape.

**C. Drying Type Joint Compound:** Vinyl-based ready-mixed type for interior use, and as follows:

1. All-purpose type, for both embedding tape and as topping.

**D. Joint Compound:** At joints and fasteners in water-resistant gypsum backing board intended for tile surfacing, provide compound specifically recommended or permitted by manufacturer of gypsum board.

**E. Provide adhesive to laminate GWB in new restroom or install furring strips if wall is not plumb.**
2.7 MISCELLANEOUS ACCESSORIES

A. Metal accessories shall consist of corner beads, stops, edge trim, casing beads and control joints and other accessories as required, conforming to proper profiles and sizes to accommodate drywall partition components encountered. Accessories: formed of 26 galvanized or cadmium plated steel after manufacture. Hot dip galvanized as per ASTM A-525.

1. For terminations as indicated, provide USG Series 200 casing beads (J-molding not acceptable).

B. Screws for securing drywall and accessories in place: self-drilling, self-tapping, Phillips head steel screws as recommended by the manufacturer of the partition system and by conditions encountered in the field. The use of nails for application will not be permitted. Screws shall conform to ASTM C-646.

C. Joint and recess fastener treatment: a three (3) coat application as recommended by the approved gypsum drywall manufacturer. Materials shall conform to ASTM C-475.

D. For supports to hang equipment on wall: provide metal strip secured to vertical studs.

E. Reglets and Reveals: see drawings for types.

PART 3 - EXECUTION

3.1 INSPECTION

A. Study the contract drawings and specifications with regard to the work as shown and required under this section so as to ensure its completeness.

B. Examine the surfaces and conditions to which this work is to be attached or applied, and notify the Architect if conditions or surfaces exist which are detrimental to the proper and expeditious installation of the work. Starting on the work shall imply acceptance of the surfaces and conditions to perform corrective measures before the start of installation.

C. Verify dimension taken at the job site, affecting the work. Bring field dimensions which are at variance to the attention of the Architect. Obtain decision regarding corrective measures before the start of installation.

D. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.

3.2 WORKMANSHIP

A. Install materials and partition systems specified herein and as indicated on the drawings in strict accordance with the printed directions and/or specifications of the
approved manufacturer to attain fire ratings noted on the drawings.

B. Apply drywall with the reverse side against the framing members, and with the separate panels in moderate contact. In no case shall the panels be forced into place. At interior and exterior corners, conceal the cut edges of the panels so that the corners of any four panels will not meet at the same point. Vertical joints shall not occur on the same stud on both sides of a partition. Apply panels in such lengths as will result in a minimum of joints.

C. Build into drywall partitions reinforcing plates on not less than 3/16” thick to accommodate items which will be secured on and/or hung from the drywall partitions such as: wall mounted equipment. (see drawings for location of accessories). Coordinate with other trade contractors as required.

D. Unless otherwise indicated, provide continuous faces of gypsum drywall partitions, with control joints, spaced not over 30 feet o.c. Verify control joint locations with the Architect prior to installation.

3.3 ENVIRONMENTAL CONSIDERATIONS

A. Where feasible, one or both of the following procedures shall be used to minimize the exposure of gypsum wallboard to materials or finishes which have high short-term emissions of VOC’s, formaldehyde, particulates, or other air-borne compounds:

1. The gypsum wall board shall be taped, spackled and primed before the installation of the highly-emitting materials.
2. The gypsum wallboard shall be installed after the installation of the highly-emitting materials.

Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paint, wood preservatives, and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders.

3.4 FRAMING FOR PARTITIONS AND FURRING

A. Floor and ceiling runners: accurately locate and align and install continuously at locations noted, and securely attach to adjacent construction using power driven anchors spaced 16” o.c. Anchor floor runners not over one (1) inch from runner ends.

B. Two continuous beads of sealant, one along either edge shall be placed at the bottom of floor runner channels prior to anchoring to floor.

C. Position and anchor all studs vertically in the runners, spaced as recommended by the manufacturer but not more than 16” on center. Anchor studs which are located
adjacent to door frames, partition intersections, furred wall, and at corners to floor and ceiling runner flanges with required screws.

D. Install studs in all cases in one piece from noted floor location to underside of the encountered structure or to horizontal termination runner.

E. When drywall panels are not scheduled to go on the underside of the structure, provide an additional horizontal stud member at the point above the ceiling line where the drywall panels are terminated. Brace to underside of slab above with every other stud - plus diagonal bracing at same spacing (if required).

F. Locate double studs not more than 2" from all door frame jambs, abutting partitions, partition corners and other construction, and as indicated on the drawings.

G. Provide double studs at jambs of door and window frames and head and sill runners as required to completely frame out these openings. Screw to runners at top and bottom and both sides. In addition, provide two (2) braces to slab above head runners.

H. Over metal doors and borrowed lights, place a section of runner track horizontally with a web-flange bent at each end. Fasten with one positive attachment per flange.

I. Provide additional studs and runners to conform to details noted and/or required by conditions encountered in the field.

### 3.5 GYPSUM DRYWALL

A. Apply drywall with long dimension (parallel) to framing members, with abutting ends and edges occurring over stud flanges. Use panels of the maximum practical length to minimize joints. Arrange joints on opposite sides of the partition to occur on different studs. Cut panels to fit outlets, switch boxes and all other items encountered which penetrate the drywall surfaces.

B. For vertical single-layer drywall application, space 1" screws a maximum of 12" o.c. in the field of the panel and 8" o.c. staggered along the vertical abutting edges.

C. For horizontal single-layer drywall application, space 1" screws a minimum of 12" o.c. in the field of the panel and 12" o.c. along the abutting edges.

D. Stagger drywall joints above door openings and not opposite each other on the same stud at door heads. At door jambs, secure drywall panels to each stud of the double stud arrangement with screws spaced 8" on center into each stud.

E. Horizontal drywall joints not permitted.

F. If drywall panels are not scheduled to extend to underside of structure, then extend panels a minimum of 6 inches above the finished suspended ceilings as shown.

### 3.6 ACCESSORIES

A. Install corner beads on all exterior corners in one length without joints and secure with fasteners spaced 9" O.C. on both sides. Corner beads: formed to an angle of 90 degrees with 1-1/4" fine mesh flanges.

B. Wherever an end of drywall will remain exposed or cannot be taped, provide continuous casing beads over face layer and secure in place with fasteners spaced 9"
O.C. "J" molding is not acceptable.

C. Provide control joints in the face layer at continuous walls exceeding 30'-0" and where indicated on the drawings and staple in place in a secure and rigid manner. (See plans for location of control joints in ceiling).

D. Drywall abutting dissimilar materials shall terminate in casing beads fastened to terminal stud only. "J" molding is not acceptable.

E. See details for additional reveals and trim.

3.7 TREATMENT FOR JOINTS AND FASTENERS

A. Completely fill all joints formed by the drywall panels and/or adjoining materials with a three (3) coat application of joint cement and tape. Joint treatment compound shall be mixed according to the approved manufacturer's directions.

B. Drive fasteners in slightly below the surface of the board, with heads forming a slight depression below the surface of the drywall. Fasteners shall not be driven closer than 3/8" from edges and ends of boards. Drywall adjacent to the joint of fastening shall be held tightly against the framing members while driving fasteners. Dependence on fasteners to draw drywall against the framing will not be acceptable.

C. All boards shall fit tightly against the supporting framework before applying joint treatment and concealing screw depressions.

D. Joint Compound and Taping:
   1. Mix joint compound in strict accordance with manufacturer's recommendations.
   2. Apply taping or embedding compound in a thin uniform layer of all joints and angles to be reinforced. Immediately apply reinforcing tape centered over joint and seated into compound. Sufficient compound - approximately 1/64" to 1/32" - must remain under the tape to provide proper bond. Follow immediately with a thin skim coat to embed tape, but not to function as a second coat. Fold and embed tape properly in all interior angles to provide a true angle. The tape or embedding coat must be thoroughly dry prior to application of second coat.
   3. Apply second coat of joint compound over embedding coat, filling panel taper flush with surface; cover tape and feather out slightly beyond first coat. On joints with no taper, cover the tape and feather out at least 4" on either side of tape. Allow second coat to dry thoroughly prior to application of finish coat.
   4. Spread finish coat evenly over and extend slightly beyond second coat on all joints and feather to a smooth, uniform finish. Over tapered edges, do not allow finished joint to protrude beyond plane of the surface. Apply a finish coat to cover tape and taping compound at all tapered angles and provide a true angle. Where necessary, sand between coats and following the final application of compound to provide a smooth surface ready for decoration.

E. Finishing Fasteners
1. Apply a taping or all-purpose type compound to fasten depressions as the first coat. Follow with a minimum of two additional coats of topping or all-purpose compound, leaving all depressions level with the plane of the surface.

F. Finishing Beads and Trims
   1. Apply first coat to all bead and trim and properly feather out from ground to plane of surface. Compound must thoroughly dry prior to application of second coat.
   2. Apply second coat in same manner as first coat, extending compound slightly beyond onto face of panel. Compound must be thoroughly dry prior to application of finish.
   3. Apply finish coat to all bead and trim, extending compound slightly beyond the second coat and properly feathering from ground to plane or surface. Sand finish as necessary to provide a flat, smooth surface ready for decoration.

3.8 PREPARATION FOR FINISHES

A. All exposed surfaces of gypsum drywall which have depressions, gouges, cuts and dimples shall be spackled and sanded to present a smooth level surface acceptable for painting and wall covering by other trades.

B. Spackle openings around pipes, switches and all other framed openings.

3.9 CLEANING

A. Promptly remove joint compound from doors, door frames, windows, floors and all other surfaces which are not scheduled to receive the joint compound.

B. At the completion of installation, remove all rubbish, excess material, scaffolding, tools, and other equipment from the building and job site and leave surfaces clean and whole.

END OF SECTION 09 29 00
 SECTION 09 50 00 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide acoustical ceiling Work as indicated on Drawings and as specified herein, including the following:
      a. Lay-in panel installation - exposed grid

1.2 SUSTAINABILITY REQUIREMENTS

A. The Contractor shall implement practices and procedures to meet the Project’s sustainable requirements. The Contractor shall ensure that the requirements related to these goals, as defined in Specification Section S01352, Sustainability Requirements, and as specified in this Section, are implemented to the fullest extent. Substitutions or other changes to the work shall not be proposed by the Contractor or their sub-contractors if such changes compromise the stated Sustainable Design Performance Criteria.

B. Sustainability requirements included in the Section are as follows:

   1. Meet established minimum post and pre-consumer percent content for specified mineral based acoustical tiles and panels.
   2. Documentation of Recycled materials.

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.


C423 Test Method for Sound Absorption and Sound Absorption Coefficient by the Reverberation Room Method.

C635 Metal Suspension System for Acoustical Tile and Lay-In Panel Ceilings.
C636  Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

D1779  Specification for Adhesion for Acoustical Materials

E84  Surface Burning Characteristics of Building Materials.

E90  Standard Test Method for Laboratory Sound Transmission Class


E413  Determination of Sound Transmission Class

E1264  Standard Classification for Acoustical Ceiling Products.

E1414  Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a common Ceiling Plenum (CAC)

E1477  Standard Test Method for Luminance Reflectance Factor (LR) LR1 >75%

C.  AMA -1-II Ceiling Sound Transmission Test By Two-Room Method

D.  Underwriters Laboratories Inc. (UL)

Fire Resistance Directory

E.  Acoustical and Insulation Materials Association, "Job Conditions".

F.  New York City Board of Standards and Appeals (BSA) approvals, or New York City Materials Equipment Acceptance (MEA) approvals.

1.4  DEFINITIONS

A.  Direct Suspension System:
    Directly fastened to floor or roof construction above, installed as part of the Work of Section 051700.
1.5 SUBMITTALS

A. Product Data:
Submit manufacturer's product specifications and installation instructions for ceiling materials, indicating compliance with applicable requirements. Include information pertaining to fire performance, flame spread, and smoke development.

B. Shop Drawings:
Submit shop drawing details indicating the relationship to mechanical and electrical Work and other items penetrating or connected to the ceiling. Indicate framing and support details for the ceiling Work.

C. Samples:
1. Submit samples of the following materials, prior to installation;
   a. Acoustical panels: 6"x6" samples of each type, pattern and color.
   b. Exposed runners and moldings: 8" long samples of each color and system type required.

D. Quality Assurance Submittals
1. Affidavit certifying experience of installation company.
2. New York City MEA or BSA approval reports, as applicable.

E. Project Closeout Submittals
1. Guarantee
2. Extra Materials (Attic Stock)

F. Low Emitting Materials Compliance Submittals:
1. Provide documentation for each sealant and adhesive to be used indicating that the sealants and adhesives comply with V.O.C. requirements as stated in Specification Section G01600.

G. Sustainable Submittals:
1. Submit Contractor’s Sustainable Materials Form with complete information on recycled content for ceiling tile materials provided under the work of this section in accordance with Section S01352, Sustainability Requirements. Include cost of materials and percentage, by weight, of materials that have post-consumer or pre-consumer recycled content for the following:
   b. Mineral based panels.
2. Submit documentation of recycled content in ceiling tile materials – product data, mix design information, or manufacturer’s statement.
1.6 QUALITY ASSURANCE

A. Qualifications:
Installer is to be a firm with not less than (5) five years of successful experience in the installation of specified materials.

B. Regulatory Requirements:
1. Building Code: Work of this Section shall conform to all requirements of the N.Y.C. Building Code and all applicable regulations of other governmental authorities.
2. New York City Board of Standards and Appeals (BSA) approvals, or New York City Materials Equipment Acceptance (MEA) approvals when applicable.
3. Acoustical and Insulating Materials Association

C. Fire Performance Characteristics:
Provide ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify ceiling components with appropriate marking of applicable testing and inspecting agency.
1. Surface Burning Characteristics: Tested per ASTM E84. Tested surfaces shall be the surfaces facing the occupied space.
   a. Flame Spread: 25 or less.
   b. Smoke Developed: 25 or less.
2. All materials exposed to the airflow in ceiling cavity plenums used for supply, return, or exhaust air shall be non-combustible or limited-combustible and have a maximum smoke developed index/rating of 50, as defined by and in accordance with NYC Building Code Reference Standard RS13-1. Flame spread index shall not exceed 25. Tested surfaces shall be the surfaces facing the plenum.

D. Fire Resistance Ratings:
When the drawings indicate that the acoustical ceiling construction is part of a fire-rated floor/ceiling or roof/ceiling assembly, provide MEA or BSA reports indicating approval of the ceiling for use in the assembly described.

E. Coordination of Work:
Coordinate layout and installation of ceiling units and suspension system components with other work above, supported by, or penetrating through ceilings, including light fixtures, HVAC equipment, fire-suppression systems and partitions. Resolve all discrepancies and conflicts prior to start of Work.
F. Pre-installation Meeting:
Prior to start of Work, installer of ceiling system and representatives of trades involved are to have a conference at the job site, in the presence of the Authority representative, to discuss coordination of ceiling system installation and resolve all discrepancies.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
Deliver all acoustical units in manufacturer's original, unopened packages fully identified with type, finish, performance data and compliance labeling.

B. Storage:
1. Store materials where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.
2. Store tile containers in space where they will be installed for at least 24 hours prior to installation to stabilize moisture content and temperature.

C. Handling:
Handle ceiling units carefully to avoid chipping edges or damaging units in any way.

1.8 PROJECT CONDITIONS

A. Space Enclosure:
Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet work in space is completed and dry, work above ceilings is completed, and until air temperature and humidity are maintained at values of final occupancy.
1. Pressurized plenums: Operate HVAC system for not less than 48 hours before beginning acoustical panel installation.

1.9 GUARANTEE

A. Work showing defects in workmanship or materials within the one year guarantee period specified in the Contract shall be corrected as directed by the Owner. Defects include but are not limited to:
1. Tiles or suspension system loose or improperly secured.
2. Tiles or suspension members showing discoloration or cracking.
3. Tiles or suspension members warping, sagging, or deforming.

1.10 EXTRA MATERIALS
A. Deliver extra materials to the College’s Representative. Furnish extra materials, described below, matching products installed, packaged with protective covering for storage and identified with appropriate labels.

1. Acoustical Ceiling Units: Furnish ___ square feet of full size units.

PART 2 - PRODUCTS

2. 1 MANUFACTURERS, MODELS

A. Acoustical Tile
   1. Mineral Composition Tile (12” x 12”)
      a. Armstrong World Industries
      b. Celotex / BPB America Inc.
      c. USG Interiors Inc.

2. 2 MATERIALS - ACOUSTICAL TILES AND PANELS

A. Mineral Fiber Tile and Panels
   1. Provide units per ASTM E1264; of designation, style, finish, color, acoustical range, edge detail and size as indicated below:
      a. Suspended (Exposed grid, lay-in) Installation

      Style: Medium Texture
      Size: 24" x 24" x 3/4", or as indicated.
      Edge Profile: Reveal tegular, or as indicated.
      Weight: 1.30-1.55 lbs./sq.ft.
      NRC: Min. .70
      CAC: Min. 35
      Light Reflectance Min. .84 Average
      Color: White “Lyra”
      Finish: Factory finish

   2. Mineral products shall be manufactured with a minimum of 60% of post and pre-consumer content materials.

C. Provide fire-rated ceiling systems when indicated on the Drawings as part of a fire-rated assembly, with ratings as stipulated.

2. 3 MATERIALS - METAL SUSPENSION SYSTEMS - INDIRECT HUNG

A. Exposed Grid Suspension System:
Manufacturer's standard system, with face width, design and finish as selected by
the Project Architect.
1. Structural Classification: Heavy-duty system in accordance with ASTM C 635.
2. Face width: 15/16" face or as otherwise indicated.
3. Main runners: Connect to direct suspension system (refer to Specification
   Section 051700). Conform to ASTM C 635 for heavy-duty classification.
4. Provide runners suitable for attachment of hold-down clips and impact
   clips as applicable.
5. Hold-Down Clips for Non-Fire-Rated Ceilings: For ceilings composed of
   lay-in panels, provide hold-down clips spaced 2'-0" o.c. on all cross tees.

2. 4 MISCELLANEOUS MATERIALS

A. Edge Moldings and Trim Pieces:
   Provide manufacturer's standard molding for edges and penetrations of ceiling
   units which fit with type of edge detail and suspension system indicated.

B. Tile Fasteners:
   Cadmium plated, type recommended by tile manufacturer, but for not less than
   1/2" penetration of substrate.

C. Drop Clips:
   18 gage galvanized steel with key hole slot, or other configuration approved by
   New York City Dept. of Buildings for connection of ceiling suspension members
to carrying channels.
   Drop clips shall be of length required for indicated ceiling height,
   and to provide clearances for lighting fixtures, mechanical
equipment, and other items above the ceiling. Where necessary
because of limited clearance, provide clips that connect runners
tight to the bottom of carrying channels.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the building before beginning Work to determine that it is properly
   enclosed and the structure is in proper condition to receive acoustical materials
   and suspension system. Area shall be broom cleaned and uninterrupted for free
   movement of rolling scaffold. Do not proceed until satisfactory conditions
   prevail.

B. Verify that direct suspension system has been installed properly, that main
   runners are spaced evenly and have been leveled to a tolerance of 1/8" in 12'
measured both lengthwise on each runner and transversely between parallel runners so that indirect suspension system installation may proceed accurately.

C. Start of Work constitutes acceptance of existing conditions, therefore, contractor is advised to bring any discrepancies to the attention of the Architect prior to start of Work.

3.2 PREPARATION

A. Coordination:
- Provide and coordinate the locations of inserts, clips, or other supports for support of acoustical ceilings.
- Determine the length of drop clips required to maintain indicated ceiling height and to provide necessary clearance for electrical, mechanical and other equipment. Where necessary for clearance, clips that connect runners tight to the bottom of carrying channels shall be used.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans.

3.3 INSTALLATION - GENERAL

A. Install materials in accordance with manufacturer's printed instructions and in compliance with ASTM C636, governing regulations, fire resistance rating requirements, as indicated.
   1. Coordinate requirements for Work of other trades to be built into ceiling system. Provide supplementary framing as required.

B. Arrange directionally-patterned units (if any) in manner shown by reflected ceiling plans, or as approved by the Project Architect. Install in patterns indicated, (balanced borders all sided) symmetrical or centered about center line of room, panels, fixtures, beam haunches, rooms, spaces.

C. Cut as required for installation of electric fixtures, air diffusers, grilles, sprinkler heads, security devices, access doors, etc., provided under contract. Verify sizes and locations with other trades.

D. On completion, the acoustic ceilings shall present a uniform horizontal plane surface, unless otherwise indicated, free from blemishes and imperfections.

E. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
2. Screw-attach moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.

F. Install panels in coordination with suspension system with suspension members concealed by support of tile units. Scribe and cut panels to fit accurately at borders and penetrations.

3. 4 ADJUSTING AND CLEANING

A. Clean exposed surfaces of ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage.

B. Remove and replace Work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

C. Remove and replace Work that is damaged or soiled by other trades as directed by the Architect.

END OF SECTION
SECTION 09 65 19 - RESILIENT TILE FLOORING AND BASE

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Rough Carpentry: Section 06 10 00

1.2 SUBMITTALS

A. Product Data: Manufacturer's specifications, and surface preparation and installation instructions, for each material specified except primer.

B. Samples:
   1. Resilient Tile: 6” x 6”, each type, size, and color required.
   2. Base: 6 inch long sections, each type, size, and color required.
   3. Edge Strips: 6 inch long sections, each type and color required.

C. Quality Control Submittals:
   1. Certificates: Certificates required under Quality Assurance Article.

D. Contract Closeout Submittals:
   1. Maintenance Data: Deliver 2 copies covering the installed products, to the Architect.

1.3 QUALITY ASSURANCE

A. Compatibility of Materials: For each type of tile specified, furnish associated materials made by or recommended by the tile manufacturer.

B. Certifications: Furnish certification from flooring installer that the substrate surfaces have been examined and are acceptable for installation of the Work of this Section.

C. Performance Criteria:
   1. The following criteria are required for products included in this section:
      a. All tile flooring must be certified as compliant with the FloorScore standard by an independent third-party.
      b. Adhesives must not exceed the volatile organic compound (VOC) content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1168.

1.4 PROJECT CONDITIONS

A. Environmental Requirements: Continuously heat spaces to receive flooring to a temperature of 68 degrees F for at least 48 hours prior to flooring installation, during the installation, and for 48 hours after installation.
B. Environmental Requirements: Make arrangements thru the College's Representative for having the temperature in the spaces to receive flooring maintained at 68 degrees F for 48 hours prior to flooring installation, during the installation, and for 48 hours after installation.

C. Condition flooring materials by placing them in the spaces where they will be installed for at least 48 hours prior to installation.

1.5 MAINTENANCE

A. Extra Materials:
   1. Furnish extra tile, equal to 2 percent of the tile installed, of each type and color of tile required. The extra tile shall be from the same run and lot number as the installed tile.
   2. Turn over extra material to the College’s Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Vinyl Composition Tile: To match existing. Provide sample for Architect’s approval.

B. Vinyl Base: To match existing. Provide sample for Architect’s approval.

C. Metal Edge Strips: Extruded aluminum, mill finish; butt type for concealed anchorage; countersunk stainless steel fasteners, with anchors suitable for type of subfloor indicated.

D. Resilient Edge Strips: Homogeneous vinyl; not less than one inch wide, 1/8 inch gage; tapered bullnose edge.
   1. Color/Pattern: Matching floor tile.

E. Resilient Feature Strips: Same material composition and gage as adjoining floor tile. Size and color/pattern shall be as shown on the Drawings.

F. Underlayment:
   1. Mastic Type: Latex underlayment or other mastic underlayment recommended by flooring material manufacturer for the type of substrate indicated.
   2. Felt: No. 15 asphalt saturated felt.

G. Primer for Porous or Dusty Concrete: Tile adhesive manufacturer's recommended primer for preparation of porous or dusty concrete.

H. Tile Adhesive: Water resistant, formulated for application on type of subfloor indicated, and recommended by the tile manufacturer.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Examine substrate surfaces to receive the Work of this Section for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected, and installer's substrate surface acceptability certification has been acknowledged by the Facilities Representative.
      a. Concrete Subfloor Bond Tests: Check for surface moisture and coatings on concrete subfloor by bond tests as recommended by the tile manufacturer.

   2. Do not install the Work of this Section until after all other finishing operations, including painting, have been completed unless otherwise indicated or directed by the Director's Representative.
      a. Where movable partitions are indicated, install flooring before partitions are erected without interrupting floor pattern.

3.2 SURFACE PREPARATION

A. Unless otherwise specified, follow the materials manufacturers' written instructions.

B. Remove dirt, grease, oil, paint, varnish, wax, sealers, and other contaminants which may impair the full bonding of the materials.

C. Concrete Subfloor:
   1. Remove trowel marks or other projections by grinding or sanding.
   2. Level uneven surfaces with smooth troweling of mastic underlayment. Follow underlayment manufacturer's application and curing instructions.
   3. Provide a substrate surface with not more than 1/8 inch in 10'-0" variation from level or required slope.
   4. If recommended by flooring material manufacturer, treat porous and dusty concrete with primer after vacuum cleaning the surface. Apply primer at the rate recommended by the primer manufacturer.

E. Immediately before application of the flooring adhesive, vacuum clean the prepared subfloor surface.

3.3 INSTALLATION

A. Install the flooring from center marks established with principal walls; lay out the tile field and adjust to avoid use of cut units less than one-half tile wide at perimeters. Match tile units for color and pattern by using the tile in manufactured and packaged sequence.
   1. Lay all tile units with grain running in the same direction.
   2. Lay tile units in "checkerboard" pattern with grain direction reversed in alternate tiles.
B. Install tile units in adhesive bed in compliance with manufacturer's printed instructions. Butt tile units tightly to vertical surfaces, thresholds, nosings, and edgings. Scribe tile around obstructions and openings as necessary to produce neat joints. Install tile evenly in straight, parallel lines. Extend tile into toe spaces, door reveals, closets and other similar openings.

C. Install tile on pan type access cover plates for electrical and telephone ducts and other such items which occur within finished resilient tile floor areas. Maintain color and pattern continuity with tile installed on such areas.

D. Install resilient edge strips at unprotected edges of flooring, unless otherwise indicated.

E. Install metal edge strips where indicated. Securely fasten in place.

F. Install resilient base in compliance with manufacturer's printed instructions. Install base on walls, partitions, columns, and permanent fixtures unless otherwise indicated. Install base in as long lengths as practicable, with preformed external corner units. Miter internal corners. Scribe and fit base to door frames and other interruptions.
   1. On masonry and other irregular surfaces, fill voids behind base with filler/wall patch.

3.4 CLEANING

A. Remove any excess adhesive and other surface soiling from face of installed materials with cleaning agents recommended by the manufacturer of the material being cleaned.

3.5 PROTECTION

A. Protect installed flooring from traffic and damage. Apply non-staining kraft paper covering where necessary. Maintain covering until directed to remove it by the Director's Representative.

3.6 FINISHING

A. Prior to the final inspection, when directed by the Facilities Representative, thoroughly clean tile floors and accessories. Apply 2 coats of floor finish and buff to finish. Comply with the tile manufacturer's recommended cleaning, finishing, and buffing procedures.

END OF SECTION 09 65 19
SECTION 09 70 50 – URETHANE CEMENT COMPOSITION FLOORING

PART 1   GENERAL

1.01   GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.02   WORK INCLUDED

A. Work of this Section includes all labor, materials, equipment and services necessary to complete the urethane cement composition flooring and integral base as scheduled on the drawings and/or specified herein.

1.03   RELATED WORK

A. Submittals - Section 013300.

1.04   SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product Data: Submit manufacturer's technical data, application instructions and general recommendations for the urethane cement composition flooring specified herein.

C. Samples for initial selection purposes in 402 Dark Gray
   1. Submit 2-1/2” x 4” samples in 402 Dark Grey.

D. Samples for Verification: For each resinous flooring system or color specified, Provide 2 each, 6 inches (150mm) square samples in the selected color and texture, applied to a ridged backing by the installing contractor for this project.

E. Material certificates signed by manufacturer certifying that the urethane cement composition flooring supplied for the project complies with requirements specified herein.

F. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.

G. Contractor Certification: Submit a letter from the primary materials manufacturer certifying that the installing contractor has been properly trained in the application of the materials being installed, is acceptable to the materials manufacturer, with a record of successful in-service performance.
   1. Engage an installer who employs only persons trained and approved by the resinous flooring manufacturer for applying resinous flooring systems specified.
2. Engage an installer who is certified in writing by the resinous flooring manufacturer as a factory trained applicator qualified to apply the specified resinous flooring system.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer or applicator that has specialized in installing resinous flooring types similar to that required for this Project and who is acceptable to manufacturer of primary materials.

B. Single-Source Responsibility: Obtain urethane cement composition flooring materials, including primers, resins, hardening agents, and finish or sealing coats, from a single manufacturer. Provide secondary materials, including patching and fill materials, joint sealant, accessory items, and repair materials. Of a type and from a source recommended by the manufacturer of the primary materials.

C. Qualified Materials: Request for material approvals for any products other than the specified products must be submitted to the architect two weeks prior to the bid, including complete application specification, physical characteristics, and chemical resistance data. Any request after this date will not be accepted. Failure of performance requires immediate removal and replacement of unapproved substituted material with those originally specified at no cost to the owner, architect, construction manager, or general contractor.

D. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set the standard of quality for materials and installation.
   1. Apply all components of the specified resinous flooring system at the specified thickness and finished in the texture and color as selected. Apply a minimum 100 square feet area to simulate the actual installation characteristics. Include areas that demonstrate the finished cove base, joint detailing, terminations or any other special conditions.
   2. Simulate finished lighting conditions for Architects review of mockups.
   3. Approved mockups may become part of the completed work if undisturbed at the time of substantial completion.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.

B. Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

1.07 PROJECT CONDITIONS

A. Environmental Conditions: Comply with urethane cement composition flooring manufacturer's directions for maintenance of ambient and substrate temperature,
moisture, humidity, ventilation, and other conditions required to execute and protect Work.

B. Lighting: Permanent lighting will be in place and working before installing resinous flooring.

C. Moisture Vapor Transmission: Perform Calcium Chloride test in conformance to ASTM F1869 or In Situ relative humidity test conforming to ASTM F2170 to determine moisture vapor emission levels prior to application of any component of the flooring system. Do not install flooring over substrate with MVT emission levels in excess of 14 lbs. per 24 hour period over a 1000 square foot area or with a relative humidity in excess of 88%. Notify the architect immediately if MVT or rh levels exceed these levels.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Troweled urethane cement composition flooring shall be Dex-O-Tex Tek-Crete SL-B as manufactured by Crossfield Products Corp. in Rancho Dominguez, California and Roselle Park, New Jersey.

2.02 PROPERTIES

A. Colors: As indicated, or if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

B. Physical Properties:
Provide flooring system that meet or exceed the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

Compressive Strength (ASTM C579) ......................................................... 8,100 psi
Thermal Distortion (350°F Emersion)..................................................Passes
Tensile Strength (ASTM C307)................................................................. 1,000 psi
Flexural Strength (ASTM C580)............................................................... 2,000 psi
Thermal Co-Efficient of Thermal Expansion (ASTM C531)............... 1.5x10^5
Density (ASTM C905)............................................................................. 130 lbs/ft^3
Water Absorption (MIL PRF-3134).......................................................0.64%
Surface Hardness (ASTM D2240).........................................................85-90 Durometer "D"
Abrasion Resistance (ASTM D1044)......................................................0.0 gr.
Adhesion (ASTM D4541).................................................................>400 psi (100% failure in concrete)
Flammability-Critical Radiant Flux (ASTM E648).........................Greater than 1.07 watts/cm^2

URETHANE CEMENT COMPOSITION FLOORING 09 70 50 - 3
Resistance to Fungal Growth (ASTM G21) .................................................. Passes Rating 1

PART 3.00 - EXECUTION

3.01 INSPECTION

A. Examine the areas and conditions where the urethane cement composition flooring is to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Architect.

B. Moisture Test: Perform moisture test in conformance with ASTM F 1869 and ASTM F 2170

3.02 PREPARATION

A. Substrate: Perform preparation and cleaning procedures according to flooring manufacturer's instructions for particular substrate conditions involved, and as specified. Provide clean, dry, and neutral substrate for flooring application.

B. Concrete Surfaces: Shot-blast, or power scarify as required to obtain optimum bond of flooring to concrete. Remove sufficient material to provide a sound surface free of laitance, glaze, efflorescence, and any bond-inhibiting curing compounds or form release agents. Remove grease, oil, and other penetrating contaminate. Prepare substrate in accordance with SSPC SP 13. Repair damaged and deteriorated concrete to acceptable condition. Leave surface free of dust, dirt, laitance, and efflorescence.

C. Materials: Mix resin hardener and aggregate as required, and prepare materials according to flooring system manufacturer's instructions.

3.03 APPLICATION

A. General: Apply each component of urethane cement composition flooring system according to manufacturer's directions to produce a uniform monolithic flooring surface of thickness indicated.

B. Body Coat: Over prepared surface, Screed mortar mix at nominal 3/16” – ¼”-inch thickness as specified. Allow material flow out and begin to settle. Back roll with a spike roller or looped roller as appropriate to distribute material to a smooth even finish.

C. Broadcast Aggregate: Broadcast selected size and type of slip resistant aggregate into the wet Body Coat. Apply to even distribution and texture, allow to cure.

D. Remove Excess Aggregate: Remove all loose or unsound aggregate from the cured surface. Vacuum up all dust and fine particles from the surface, remove any ridge lines and detail all imperfection in the textured surface.

E. Apply the seal coat in the selected color as recommended to produce a surface matching
the submittal sample and project mock-up samples.

F. Cove Base: Apply cove base mix to wall surfaces at locations shown to form cove base height of 4 inches unless otherwise indicated. Follow manufacturer's printed instructions and details including taping, mixing, troweling, and sanding, of cove base.

3.04 CURING, PROTECTION AND CLEANING

A. Cure urethane cement composition flooring materials according to manufacturer's directions, taking care to prevent contamination during application stages and before completing curing process. Close application area for a minimum of 24 hours.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes requirements for reduced emission, reduced toxicity interior paints (primers & top coats) and anti-corrosive paints for metal in interior applications.

B. Work Included: Provide painting in accordance with the Contract Documents. The Work of this Section shall include but not be limited to the following:
   1. Gypsum board walls and ceilings, concrete ceilings, hollow metal doors and frames, wood trim.
   2. Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color is not designated, the Architect will select these from standard colors.

C. Work Not Included:
   1. Concealed Surfaces: Painting is not required on surfaces in concealed and generally inaccessible areas.
   2. Finished Metal Surfaces: Anodized aluminum factory-finished aluminum, bronze, stainless steel, and similar finished metals will not require painting. Exposed no-hub piping will not require painting.
   3. Do not paint hinges, locks or joints of access covers, plates and doors.
   4. Do not paint glass or concrete.
   5. Do not paint joint of wall surfaces and any applied plates such as light switches, receptacles and escutcheons. Allow paint to completely dry prior to reattachment of such devices to prevent binding.
   6. Do not paint any artwork, signs, room numbers

D. Labels: Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 REFERENCES

A. Federal Specifications TT
   1. Primers, Sealers, Undercoats
      a. Metal Primer (Zinc Dust, Zinc Oxide) for Galvanized surfaces: FS TT-P-641
      b. Metal Primer (Zinc Chromate) Aluminum or Steel surfaces: FS TT-P-645
      c. Primer Sealer (Latex Emulsion): FS TT-P-650
      d. Enamel Undercoat (Alkyd Resin): FS TT-E-545
      e. Alkyd Primer (Corrosion Inhibiting): FS TT-P-664
2. Finish Paints
   a. Alkyd Enamel, Gloss: FS TT-E-489
   b. Interior Latex, Flat: FS TT-P-29
   c. Interior Alkyd, Gloss: FS TT-E-506
   d. Latex Semi-Gloss Enamel: FS TT-P-1511
   e. Alkyd Semi-Gloss Enamel: FS TT-E-509
      for white tints; FS TT-E-529
      Class A for deep colors.

3. Miscellaneous Materials:
   c. Color Pigments: Pure, non-fading, finely ground pigments, at least 99
      percent passing a 325 mesh sieve. Color pigments that are to be used on
      masonry, concrete and plaster shall be lime proof - FS-TT-P-381.
   d. Spackling: FS SS-P-00450.
   e. Putty: Linseed-Oil type for Wood Sash Glazing -FS-TT-P-791B.
   g. Paste Wood Filler: FS TT-F-336
   h. Plastic Wood Filler: FS TT-F-340C.
   k. Linseed Oil: Raw CID-A-A-379A

1.4 SUBMITTALS

A. Product Data
   Provide manufacturers' product literature for all materials specified. In addition to actual
   material data, submit material manufacturer's printed directions and recommendations
   for environmental conditions, surface preparation, priming, mixing, reduction, spreading
   rate, application, and storage, as applicable for each of the materials specified that will
   be used.

B. Manufacturer’s certification of product compliance with paint standards (VOC
   content and prohibited compounds) per paragraph 1.05.

C. Material Safety Data Sheets.

D. Manufacturer’s maintenance and cleaning instructions.

E. Samples
   1. Initial Selection
      See plans for colors approved for the project. Verify colors specified with
      manufacturers' color charts for availability and notify the Architect if any
      discrepancies should occur.
   2. Verification prior to installation
      a. Submit three samples of each color and material on 12" x 12" hard-
         board.
      b. Submit three samples of finish metal surfaces as required until
acceptable color, sheen and texture are achieved.

1.5 QUALITY ASSURANCE

A. General
1. All painting materials shall arrive at the job ready-mixed.
2. Remove all rejected materials from the premises immediately.
3. All thinning and tinting materials shall be as recommended by the manufacturer. Generally, all paints shall not require additional thinning and/or tinting
4. Check other Sections of this Specification that the specified shop prime paint is compatible with the total coating system. Report discrepancies to the Architect before commencing painting Work.
5. Materials selected for each system type shall be products of a single manufacturer.

B. Qualifications
Work of this Section shall be performed by personnel with a minimum of three years experience in performing this type of Work.

C. Regulatory Requirements
2. U.S. Department of Labor, Occupational Safety and Health Administration, latest regulations.

D. Certifications
Federal Specifications: When materials are specified to comply with Federal Specifications, products will be accepted which meet or exceed the performance requirements of such Federal Specifications and comply with all regulations currently in effect.
1. Indicate that material complies with Federal Specifications by including the Federal Specification number on the container label or on the product literature, or submit a statement with the Product Data stating that material meets or exceeds the performance requirements of the Federal Specification.

E. Field Samples
1. Provide samples of each color and finish, under natural lighting conditions, in a location where each finish is to be applied.

F. References/Quality Assurance (for indoor air quality and toxicity criteria)

G. Environmentally- Preferable Product Criteria:
1. VOC Content of Paints:
The volatile organic compound (VOC) content of interior paints, interior primers, and anti-corrosive paints used in interior applications shall not exceed the limits defined in the Green Seal Environmental Standards for Paints (GS-11, dated 5/20/93) and Anti-Corrosive Paints (GC-03, dated

PAINTING 09 91 00 - 3
1/7/97, of Green Seal, Washington, DC. The VOC limits defined in the referenced Green Seal standards are as follows. All VOC limits are defined in grams per liter, and exclude water and tinting color added at the point of sale (as determined by U.S. EPA Reference Test Method 24).

<table>
<thead>
<tr>
<th>Interior Paints &amp; Primers</th>
<th>Anti-Corrosive Paints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-flat:</td>
<td>Gloss: 250</td>
</tr>
<tr>
<td>Flat:</td>
<td>Semi-gloss: 250</td>
</tr>
<tr>
<td>Flat:</td>
<td>250</td>
</tr>
</tbody>
</table>

2. Additional Chemical Component Restrictions in Paints:
To the extent feasible, interior paints, interior primers, and anti-corrosive paints used in interior applications shall comply with the following chemical component restrictions of the Green Seal Environmental Standards for Paints (GS-11, dated 5/20/93) and Anti-Corrosive Paints (GC-03, dated 1/7/97), of Green Seal, Washington, DC.

a) Aromatic Compounds: the product must contain no more than 1.0% by weight of the sum total of aromatic compounds. Testing for the concentration of these compounds will be performed if they are determined to be present in the product during a materials audit.

b) Other Chemicals: the manufacturer shall demonstrate that the following chemical compounds are not used as ingredients in the manufacture of the product.

- Halomethanes: methylene chloride
- Chlorinated ethanes: 1,1,1-trichloroethane
- Aromatic solvents: benzene, toluene (methylbenzene), ethylbenzene
- Chlorinated ethylenes: vinyl chloride
- Polynuclear aromatics: naphthalene
- Chlorobenzenes: 1,2-dichlorobenzene
- Phthalate esters: di (2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, diethyl phthalate, dimethyl phthalate
- Miscellaneous semi-volatile organics: isophorone
- Metals and their compounds: antimony, cadmium, hexavalent chromium, lead, mercury
- Preservatives (antifouling agents): formaldehyde
- Ketones: methyl ethyl ketone, methyl isobutyl ketone
- Miscellaneous volatile organics: acrolein, acrylonitrile

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery
Deliver materials to the site in original, unopened containers bearing manufacturers name and label containing the following information:
1. Product name or title of material
2. Manufacturer's stock number and date of manufacture
3. Manufacturer's name
4. Federal Specification number, if applicable.
5. Federal regulations for amount of lead in paint (less the 0.06% lead in non-volatile ingredients)
6. Contents by volume for major pigment and vehicle constitutions
7. Thinning instructions
8. Application instructions
9. Color name and number

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
   1. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from use of paints.

C. To the extent feasible, do not store paint products with materials that have a high capacity to adsorb VOC emissions (i.e., materials which are woven, fibrous or porous in nature, such as acoustical ceilings, carpet, textiles, etc.). Do not store paint products in occupied spaces.

1.7 PROJECT CONDITIONS

A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 deg. F and 90 deg. F, unless otherwise permitted by paint manufacturer's instructions.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 deg. F and 95 deg. F, unless otherwise permitted by paint manufacturer's instructions.

C. Do not apply paint when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer.

1.8 GUARANTEES

A. Adherence of workmanship and materials to Specification requirements shall be maintained for the one year contract guarantee period. These requirements shall include the following:
   1. There shall be no evidence of blistering, peeling, crazing, alligatoring, streaking, staining, or chalking.
   2. Dirt shall be removed without blemishing the finish by washing with mild soap and water.
   3. Colors of surfaces shall remain free from serious fading; the variation, if any, shall be uniform.

B. Correct all defects, appearing within the guarantee period, by removal of the defective work and replacement as directed.
C. All corrective measures shall be the Contractor's responsibility, and will be made at no extra cost to the owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products of one of the following manufacturers: Colors selected are Benjamin Moore and Co. If another manufacturer is used, colors must match Benjamin Moore.
   1. Benjamin Moore and Co.
   2. PPG Industries, Pittsburgh Paints.
   3. The Sherwin-Williams Company.

2.2 MATERIALS

A. Provide products which meet all New York State VOC requirements for applications outlined herein.
B. Provide products which meet all Federal regulations for amount of lead in paint (less than 0.06% lead in non-volatile ingredients).
C. Provide best quality grade of various types of coatings as regularly manufactured by the paint materials manufacturers. Materials not displaying manufacturers' identification as a standard, best-grade product will not be acceptable.
D. Use only thinners approved by paint manufacturers for applications intended and use only within recommended limits.
E. PRIMER

Primer coat product shall meet or exceed the following:
   1. Volume Solids: 40% ± 2%
   2. Weight Solids: 51% ± 2%
   3. VOC (EPA Method 24): 90 g/L; 0.75 lb/gal
   4. Provides performance which is comparable to the products that are formulated in accordance with federal specification:
      a. A-A-2340
      b. A-A-2994, Type II
      c. TT-P-650D, Type I
   5. Spreading Rate per coat: @ 4 mils wet; 1.6 mils dry

F. INTERMEDIATE AND FINISH COATS

Intermediate and finish coat products shall meet or exceed the following:
   1. Volume Solids: 39% ± 2%
   2. Weight Solids: 53% ± 2%
   3. VOC (EPA Method 24): 0 g/L; 0.0 lb/gal
   4. Spreading Rate per coat: @ 4 mils wet; 1.6 mils dry
2.3 COLORS

A. Selection
   1. Paint colors are as indicated on Paint Schedule.

B. Colors:
   1. For multicoat systems, apply each coat using a successively darker tint or shade, unless approved otherwise.
   2. Top coat colors: As indicated in finish schedule, by reference to nomenclature of manufacturer listed on schedule. This reference is for color matching only.

2.4 PAINTING SCHEDULE

A. Interior
   1. Gypsum wall board surface in all area spaces: Semi-Gloss Enamel

2.5 INTERIOR PAINT SYSTEMS

A. Gypsum Drywall, Gypsum Soffits
   1. Eggshell Finish
      1st Coat - Latex primer sealer -- 1.0 Mils DFT
      2nd Coat – Semi-gloss latex enamel -- 1.3 Mils DFT
      3rd Coat – Semi-gloss latex enamel -- 1.3 Mils DFT

PART 3 - EXECUTION

3.1 ENVIRONMENTAL CONSIDERATIONS

A. Comply, at minimum, with paint manufacturer recommendations for space ventilation during and after installation. Where feasible, the following ventilation conditions shall be maintained during the paint curing period, or for 72 hours after application: 1) supply 100% outside air 24 hours a day; 2) supply airflow at a rate of 6 air changes per hour, when outside temperatures are between 55 degrees F and 85 degrees F and humidity is between 30% and 60%; and 3) supply airflow at a rate of 1.5 air changes per hour, when outside air conditions are not within the range stipulated in item 2 above.

B. To the extent practical, allow paint installations to cure prior to the reinstallation of materials that adsorb VOCs. Materials that adsorb VOCs include carpets, textiles, and acoustical ceiling panels.

3.2 PREPARATION

A. Protection
   1. Cover or otherwise protect all finished surfaces on the wall. Protection
includes taping, masking, and draping all items on or near the areas to be painted.

2. Floors to be protected from paint

B. Surface Preparation

1. Perform preparation and cleaning procedures in accordance with the paint manufacturer's instructions and as specified.
   a. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to other cleaning procedures. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

2. Gypsum Board: Fill cracks and other blemishes with spackling or patching compound and sand smooth.
   a. Latex-fill minor defects.
   b. Spot-prime defects after repair.

3. Plaster:
   a. Fill hairline cracks, small holes, and imperfections with latex patching plaster.
   b. Make smooth and flush with adjacent surfaces.
   c. Wash and neutralize high-alkali surfaces.

4. Mildew:
   a. Remove mildew by scrubbing with solution of trisodium phosphate and bleach.
   b. Rinse with clean water and allow surface to dry.

3.3 APPLICATION

A. General

1. No Work shall be performed in spaces which are not broom clean and free of dust and waste.

2. Apply paint materials to produce smooth finished surfaces, free of brush or roller marks, drops, runs, or sags.

3. Paint materials shall be kept at a proper and uniform consistency.

4. Thin only when necessary to achieve best results.

5. Thinners shall be turpentine, mineral spirits or material recommended by manufacturer of paint, and in quantity as recommended.

6. Excessive use of thinner as indicated by variation in absorption, lack of "hide", thickness of dry film, mottled or streaky coat, shall be cause for rejection. Correct as directed.

7. Apply all coats with brush, roller or spray, varying slightly the color of succeeding coats to achieve approved color.

8. Brush out or roll on first or prime coat; work well into surface.

9. Allow at least 48 hrs. for enamels to dry.

10. The surfaces of interior woods and metals shall be sanded or rubbed between coats to assure smooth finish and proper adhesion of subsequent coats.
11. Finish doors on tops, bottoms and side edges same as exterior faces.

3.4 CLEANING

A. General:
Contractor is required to clean-up behind each paint crew such that painting and clean-up will be a continuous uninterrupted operation. The practice of one general clean-up after completion of all painting will be strictly prohibited. This clean-up will include, but not be limited to the following:
1. Remove spots or defacement resulting from Work of this Section.
2. Retouch all damaged surfaces to leave Work in perfect finished condition.
3. If spots or defacement cannot be satisfactorily removed and retouched, re-finish the surfaces as directed.
4. Free all operating units of painted materials and leave them clean and in proper working order.
5. Remove from premises all surplus paint materials, debris and any other rubbish resulting from the Work.
6. Leave storage space clean and in condition required for equivalent spaces in project.

3.5 PROTECTION

A. Provide "Wet Paint" signs to protect newly-painted finishes. Remove temporary protective after completion of painting operations.
B. At the completion of Work, touch-up and restore all damaged or defaced painted surfaces as directed by the FIT Project Manager and the Architect.

3.6 ATTIC STOCK

A. Additional 2 gallons of each color.

END OF SECTION 09 91 00
SECTION 10 52 00 – EYE AND FACE WASH

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Division –1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK
   A. Provide all Eye and Face Wash equipment as indicated on the Drawings and as specified herein.

1.3 REFERENCES
   A. Underwriter’s Laboratories, Inc. (UL)

1.4 SUBMITTALS
   A. Product Data
   B. Brochure of product, accessories and installation details.

1.5 QUALITY ASSURANCE
   A. Products
      By a single manufacturer.
   B. Unit shall include ANSI compliant sign.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Deliver, store and handle products of this Section as recommended by manufacturer to protect items from damage.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS
   A. Manufacturers
      1. Guardian (Basis of design)
         1140 N North Branch St.
         Chicago, IL 60642
         312-447-8100
      2. Or approved equal
2.2 MATERIALS – EYE AND FACE WASH

A. For G1750P:
   a. Wall mounted, eye/face wash with ABS plastic bowl, ½” U.S. made chrome-plated brass stay-open ball valve, powder-coated cast aluminum flag handle and wall bracket. Unit shall have (2) polypropylene FS-Plus™ spray heads with integral “flip-top” dust covers, filters and 3.2 GPM flow control.

B. For G1849:
   a. Deck mounted AutoFlow™ swing-down eyewash less bowl with ½” IPS plug-type valve with PTFE coated O-ring seals and stainless steel enclosure. Supplied with in-line strainer to protect valve and spray heads from debris in water line. Unit shall have (2) polypropylene GS-Plus™ spray heads with integral “flip-top” dust covers, filters and 1.6 GPM flow control orifices mounted on a chrome-plated brass eyewash assembly (Specify spray head configuration). Activate valve by rotating 90° from stored position.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install Eye and Face Wash as indicated on drawings.
B. Check Eye and Face Wash for proper charge and operation, prior to installation.

3.2 CLEANING

A. Clean all surfaces of Work of this Section.

END OF SECTION 10 52 00
SECTION 12 24 94 - WINDOW TREATMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Manually operated room-darkening shades.

1.2 REFERENCES


1.3 SUBMITTALS

A. Submit under provisions of submittals section.
B. Submit Environmental Certification and Third Party Evaluation.
C. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
   3. Storage and handling requirements and recommendations.
   4. Mounting details and installation methods.
D. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, and relationship to adjacent work.
E. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.
F. Selection Samples: For each finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.
G. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.
H. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.
1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

C. Fire-Test-Response Characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

D. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

E. Environmental Certification: Submit written certification from the manufacturer, including third party evaluation, recycling characteristics, and perpetual use certification as specified below. Initial submittals, which do not include the Environmental Certification, below will be rejected. Materials that are simply 'PVC free' without identifying their inputs shall not qualify as meeting the intent of this specification and shall be rejected.

F. Recycling Characteristics: Provide documentation that the shade cloth can and is part of a closed loop of perpetual use and not be required to be down cycled, incinerated or otherwise thrown away. Scrap material can be sent back to the mill for reprocessing and recycling into the same quality yarn and woven into new material, without down cycling. Certify that this process is currently underway and will be utilized for this project.

G. Perpetual Use Certification: Certify that at the end of the useful life of the shade cloth, that the material can be sent back to the manufacturer for recapture as part of a closed loop of perpetual use and that the material can and will be reconstituted into new yarn, for weaving into new shade cloth. Provide information on each shade band indicating that the shade band can be sent back to the manufacturer for this purpose.

H. Mock-Up: Provide a mock-up (manual shades only) of one roller shade assembly for evaluation of mounting, appearance and accessories.

1. Locate mock-up in window designated by Architect.
2. Do not proceed with remaining work until, mock-up is accepted by Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.
1.6 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 WARRANTY

A. Roller Shade Hardware, Chain and Shadecloth: Manufacturer’s standard non-depreciating twenty-five year limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. MechoShade Systems, Inc. (Basis of Design)
   42-03 35th Street
   Long Island City, NY 11101
   Tel: (718) 729-2020
   Fax: (718) 729-2941
   Email: info@mechoshade.com
   Website: www.mechoshade.com

B. Or approved Equal.

2.2 APPLICATIONS/SCOPE

A. Roller Shade: to be provided for all windows on 4th floor.
   1. Shade Type 1: Manual operating interior, chain drive room in all exterior windows of rooms and spaces shown on Drawings, and related mounting systems and accessories.

2.3 SHADE CLOTH

A. MechoShade Systems, Inc.,
   1. "Euroveil Basketweave 5300 Series", .008 inches thick (.19 mm) blackout material and weighing .94 lbs. per square yard, comprising of 85% PVC (coating) and 15% polyester (yarn).
   2. Color: 5306 Silver Birch 5% Open

2.4 SHADE BAND

A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem pocket, shade roller tube, and the attachment of the shade band to the roller tube.
Sewn hems and open hem pockets are not acceptable.

1. **Hem Pockets and Hem Weights:** Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.

2. **Shade band and Shade Roller Attachment:**
   a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades, and less than 2.55 inches (64.77 mm) for motorized shades are not acceptable.
   b. Provide for positive mechanical engagement with drive / brake mechanism.
   c. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" snap-off" spline mounting, without having to remove shade roller from shade brackets.
   d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
   e. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.5 **SHADE FABRICATION**

A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.

B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design. Fabricate hem as follows:
   2. Concealed hemtube.
   3. Exposed hemtube.
   4. Exposed blackout hembar with light seal.
   5. Exposed blackout hembar with polybond seal.

C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadecloths. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

D. For railroaded shadecloths, provide seams in railroaded multi-width shadecloths as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of
plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shadebands.

E. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shadebands.

2.6 COMPONENTS

A. Access and Material Requirements:
   1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
   2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
   3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and/or polyester, or reinforced polyester will not be acceptable.

B. Manual Operated Chain Drive Hardware and Brackets:
   1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
   2. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable.
   3. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.

C. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. Notify architect of unsatisfactory preparation before proceeding with installation.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

WINDOW TREATMENTS 12 24 94 - 5
B. Prepare surfaces using the method recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install roller shades level, plumb, square, and true according to manufacturer’s written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow proper clearances for window operation hardware.
B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
C. Clean roller shade surfaces after installation, according to manufacturer’s written instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION 12 24 94