

# **MultiCare**

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## **BetterConnected**

**Tacoma General Hospital**

### **Emergency Department and Cancer Center Expansion**

**Project Manual**

September 26, 2008

**Volume 3**

Structural & Architectural





00 01 02 PROJECT TEAM

Owner:	Multicare Health System 315 Martin Luther King, Jr Way Tacoma, WA 98415-0299 P (253) 403-1243 F (253) 403-5249 Contact: Fred Russell, Contracting Officer <a href="mailto:Fred.russell@multicare.org">Fred.russell@multicare.org</a>	Architect:	Giffin Bolte Jurgens p.c. 815 SW Second Avenue Suite 600 Portland, OR 97204 P (503) 223-0992 F (503) 294-3961 Contact: David Pugh <a href="mailto:david.pugh@gbjarch.com">david.pugh@gbjarch.com</a>
Structural:	PCS Structural Solutions 950 Pacific Avenue, Suite 1100 Tacoma, WA 98402 P (253) 383-2927 F (253) 383-1557 Contact: Don Scott <a href="mailto:dscott@pcs-structural.com">dscott@pcs-structural.com</a>	Interiors:	MultiCare Health System Construction Services 315 Martin Luther King, Jr Way Tacoma, WA 98415-0299 P (253) 403-1163 F (253) 403-1610 Contact: Jill Viafore <a href="mailto:jill.viafore@multicare.org">jill.viafore@multicare.org</a>
Mechanical:	CDi Engineers 4200 194 <sup>th</sup> Street SW, Suite 200 Lynnwood, WA 98036 P (425) 672-1071 F (425) 778-8769 Contact: Jill Connell <a href="mailto:jconnell@cdiengineers.com">jconnell@cdiengineers.com</a>	Electrical:	Sparling 111 SW Fifth Ave., Suite 1575 Portland, OR 97204 P (503) 273-0060 F (503) 273-0061 Contact: Kimberly Krull <a href="mailto:kkrull@sparling.com">kkrull@sparling.com</a>
Civil:	KPFF Consulting Engineers 1201 Pacific Avenue, Suite 800 Tacoma, WA 98402 P (253) 396-0150 F (253) 396-0162 Contact: Steven Kingsley <a href="mailto:kingsley@kpfftacoma.com">kingsley@kpfftacoma.com</a>	Elevator:	Lerch, Bates Building Insight 19515 N Creek Pkwy, Suite 304 Bothell, WA 98011 P (425) 205-2205 F (425) 205-2209 Contact: Kevin Egly <a href="mailto:Kevin.Egly@LerchBates.com">Kevin.Egly@LerchBates.com</a>
General Contractor:	Skanska USA Building, Inc. 221 Yale Avenue N, Suite 400 Seattle, WA 98109 P (206) 726-8000 F (206) 328-9235 Contact: Mark Howell <a href="mailto:Mark.howell@skanskausa.com">Mark.howell@skanskausa.com</a>		

END OF SECTION



PROJECT:

MultiCare

Tacoma General Hospital  
Emergency Department and  
Cancer Center Expansion

**Architect of Record:**

Giffin Bolte Jurgens p.c.  
815 SW Second Avenue, Suite 600  
Portland, OR 97204  
503-223-0992, Fax 503-294-3951



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Architect of Record

09/26/08  
Date



PROJECT:

MultiCare

Tacoma General Hospital

Emergency Department and

Cancer Center Expansion

**Civil Engineer of Record:**

KPFF Consulting Engineers

1201 Pacific Avenue, Suite 800

Tacoma, WA 98402

253-396-0150, Fax 253-396-0162

\_\_\_\_\_  
Civil Engineer of Record

09/26/08

Date



PROJECT:

MultiCare

Tacoma General Hospital  
Emergency Department and  
Cancer Center Expansion

**Structural Engineer of Record:**

PCS Structural Solutions  
950 Pacific Avenue, Suite 1100  
Tacoma, WA 98402  
253-383-2907, Fax 253-383-1557

\_\_\_\_\_  
Structural Engineer of Record

09/26/08  
Date





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## SECTION 01 10 00 SUMMARY OF WORK

### 1.1 SECTION INCLUDES

- A. Summary.
- B. Work Covered by the Contract Documents.
- C. Issuance of Contract Documents.
- D. Bidder-Designed Work.
- E. Work by Separate Contractors, Agencies and by Owner.
- F. Contractor's Use of Site.
- G. Restoration of Site.
- H. Permits.
- I. Occupancy.

### 1.2 WORK COVERED BY THE CONTRACT DOCUMENTS

- A. Briefly and without force and effect on the requirements of the Contract Documents, the Project and Work of the Contract can be described in summary as follows:
  - 1. Construction of a new wing to Tacoma General Hospital, approximately 190,000 square feet, Type I construction, 5 stories, and remodel of approximately 22,000 square feet of existing hospital space.
  - 2. Levels 1 and 4 will house cancer center functions. Levels 2 and 3 will house emergency department functions. Level 5 will house mechanical and electrical equipment. Level 1 also has enclosed parking structure.
  - 3. The new wing has concrete slab-on-grade with continuous and spread footings, structural concrete columns up to the third level, and structural steel frame above the third level.
  - 4. The floor systems are concrete pan joists at floor levels two and three, composite concrete floor systems above the third level.
  - 5. Building exterior envelope is comprised of veneer masonry, composite metal panels and glass curtain wall systems.
  - 6. Connections to existing structures occur at all floor levels.
  - 7. The new wing is designed for future construction of two additional occupied floor levels.
  - 8. Associated plumbing, mechanical and electrical systems.
  - 9. Renovation of the existing plaza area, materials above the structural slab.
  - 10. Off-street surface parking.
  - 11. Associated site improvements and irrigated landscaping.

### 1.3 ISSUANCE OF CONTRACT DOCUMENTS

- A. The Owner has retained Skanska USA Building Inc. for preconstruction services with the intent of entering into a "Guaranteed Maximum Price" contract for construction.
- B. The Project Manual is issued in volumes. The Contractor shall be bound to the requirements of each volume as if they were bound in one combined volume.
- C. Project Manual Volumes:
  - 1. Volume 1 issued October 1, 2007 contains Project General Requirements, Divisions 00 and 01.
  - 2. Volume 2 issued June 15, 2007 for Demolition and Foundation Permits.
  - 3. Volume 3 issued April 03, 2007 containing structural and architectural requirements, Divisions 02 through 14.
  - 4. Volume 4 issued April 03, 2007 containing mechanical, electrical, site and landscaping requirements, Divisions 21 through 32.
- D. Drawings and Specifications are complementary and what is called for by one shall be binding as if called for by both. Items indicated are not necessarily included in Specifications.

### 1.4 BIDDER DESIGNED WORK

- A. Some Work categories are required to be Bidder-designed, in whole or in part and will be submitted to the authorities having jurisdiction as Deferred Submittals. For list of Work categories see Cover Sheet of Architectural Drawings.
- B. The Work above requires calculations and design by licensed engineers or firms as applicable, who will bear ultimate responsibility for the design of the systems, regardless

## SECTION 01 10 00 SUMMARY OF WORK

of the amount of criteria stipulated in the Contract Documents. The Architect and his consultants will review submittals for conformance to design criteria only.

### 1.5 WORK BY SEPARATE CONTRACTORS, AGENCIES AND BY OWNER

- A. This Project will have selected building systems commissioned. The equipment and systems to be commissioned are specified in Section **[insert]**, Part 1.4. The commissioning process, which the Contractor is responsible to execute, is defined in Division 17. The commissioning process will be directed by a Commissioning Agency whose services will be provided by the Owner.
- B. Test and Balance Contractor: The Owner will provide the services of a qualified test and balance contractor, as specified in Section **[insert]**.
- C. Special inspections will be provided by independent agencies retained by the Owner.

### 1.6 CONTRACTOR's USE OF SITE

- A. Off-street parking for Contractor use is limited to that available at the site as directed by Contracting Officer.
- B. Construction Operations: Limited to areas indicated on Contractor's Logistics Plan approved Contracting Officer.
- C. Emergency Building Exits During Construction: Maintain required access to existing emergency exits as required by governing jurisdictions.
- D. Contractor shall:
  - 1. Not unreasonably encumber Site with materials and equipment.
  - 2. Not load structure with weight that will endanger structure.
  - 3. Assume full responsibility for protection and safekeeping of stored products.
  - 4. Move stored products which interfere with Owner operations and other contractors.
  - 5. Obtain and pay for use of additional storage land work areas needed for Contractor operations if necessary.
  - 6. Provide resources for trash removal. **Hospital dumpsters and trash cans cannot be used for Contractor's trash disposal.**

### 1.7 RESTORATION OF SITE

- A. The areas around existing "K" and "L-Wings" which will be occupied by the Contractor or impacted by construction shall be restored to existing condition.
- B. It is understood that the Contractor has the most knowledge about staging the construction and the extent of restoration required. The Contract Documents therefore do not indicate new construction to replace existing.
- C. Prior to occupancy of the Site, provide a photographic record to document the conditions around the building, especially landscaping, trees and those areas that are not anticipated to be replaced.

### 1.8 PERMITS

- A. Work of this Project will be governed by the following permits, to be issued by the Tacoma Building and Land Use Services Division:
  - 1. General building permit.
- B. Cost of the above permits including plan check fees will be paid for by Owner.
  - 1. The Owner will pay plan review fees to the Washington State Department of Health.
  - 2. All other permit fees shall be paid by the Contractor or his subcontractors as applicable.

### 1.9 ENVIRONMENT OF CARE ORIENTATION

- A. The Contractor, the Contractor's employees and all subcontractors and subcontractors' employees who perform Work in the "K" and "L-Wings" will be required to undergo Environment of Care Orientation per Owner's Policy and Procedure on Orientation for Non-Clinical Agency and Contract Workers. Refer to Project Manual Volume 0.

### 1.10 HAZARDOUS MATERIALS

## SECTION 01 10 00 SUMMARY OF WORK

- A. The Owner will with his own certified staff or independent industrial hygienist, conduct a good faith Survey and identify and remove known hazardous materials, if any, from areas to be demolished, prior to Contractor's occupancy of the premises.
  - 1. Copy of Survey will be provided to Contractor prior to bidding.
- B. In the event Contractor encounters material on the Site reasonably believed to be asbestos or polychlorinated biphenyl (PCB) which has not been rendered harmless, the Contractor shall immediately stop work in the area affected and report the condition to the Contracting Officer in writing. See Owner Policy No. MHS Eng 12 under Section 01 35 20
  - 1. Work in the affected area shall not thereafter be resumed except by written agreement of the Owner and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless.
  - 2. Work in the affected areas shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless, by written agreement of the Owner and Contractor.
- C. The Contractor shall not be required to perform, without consent, any Work relating to asbestos or polychlorinated biphenyl (PCB).
- D. If reasonable precautions will be inadequate to prevent potential harmful exposure to persons resulting from a material or substance encountered on the Site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop work and report the condition to the Contracting Officer in writing.
  - 1. The Contracting Officer and Contractor shall then proceed in same manner as described in Paragraph 1.10 B of this Section.

### 1.11 OCCUPANCY

- A. Owner will continue to occupy and use the "K" and "L-Wings", elevator lobbies, stairs, and environs continuously throughout course of Work.
  - 1. Unless otherwise noted, Owner's facilities and roadways are in use 24 hours per day, 365 days per year.
  - 2. Coordinate all phases of Work affecting Owner's operations with the Contracting Officer, and representatives of user groups where deemed appropriate by the Contracting Officer.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations and use of the facilities by the public.
- C. Schedule the Work to accommodate these requirements.

END OF SECTION





## PART 1 – GENERAL

## 1.1 SECTION INCLUDES

- A. Provide all materials, labor, equipment, power and other utilities needed to construct a full-size representative mock-up of exterior features (materials, texture, colors, window[s], and configuration) of proposed building as indicated on the Drawings.
  - 1. Construct at Project Site where directed.
- B. Mock-up, when completed, shall accurately depict features and characteristics desired for proposed building, using materials and methods specified as shown in Specifications and Drawings for the building.
- C. Related Work shall be determined during design process by Architect, and shall reference the Contract Documents.

## 1.2 RELATED SECTIONS

- A. Section 05 40 00 – COLD-FORMED METAL FRAMING: Wall panel substrate.
- B. Section 07 26 00 – VAPOR RETARDERS: Separate air barriers and vapor retarders.
- C. Section 07 92 00 – JOINT SEALERS: Perimeter sealant and back-up materials.
- D. Section 08 41 00 – ENTRANCES & STOREFRONTS: Entrance framing and doors.
- E. Section 08 46 00 – AUTOMATIC ENTRANCE DOORS
- F. Section 08 80 00 – GLAZING
- G. Section 08 91 00 – CURTAINWALL
- H. Section 09 21 00 – GYPSUM BOARD ASSEMBLIES: Metal stud and gypsum board wall at interior of curtain wall.

## 1.3 QUALITY ASSURANCE

- A. All work shall be done by workmen skilled who are:
  - 1. Trained in the particular trade involved.
  - 2. Who are completely familiar with the specific materials being used and with manufacturer's recommended installation methods.
  - 3. Workmen who will actually perform the Work on this specific Project.
- B. Closely supervise the Work at the start and as it progresses to obtain the quality of work desired.
- C. Work rejected because of non-compliance shall be promptly removed and replaced at no cost to the Owner.
- D. Receive, store and protect materials or manufactured items from soiling or damage until they are in place, and provide temporary overall protection for the assembly.

## 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
- C. Samples: Submit two samples of wall panel, 12 inch by 12 inch size illustrating finish color, sheen, and texture.
- D. Submit Shop Drawings of all materials to be manufactured or fabricated to Architect not less than 2 weeks prior to construction of mock-up.

## 1.5 PRE-INSTALLATION CONFERENCE

- A. Conduct Pre-Installation Conference at Project Site under the provisions of Section 01 31 19.
- B. Schedule not less than 5 working days prior to schedule start date to build mock-up.

## PART 2 – PRODUCTS

## 2.1 MATERIALS

- A. Materials for construction of the mock-up shall be as indicated in Paragraph 1.1.B of this Section, with the following clarifications:
  - 1. The basic support framework may be constructed of wood or steel framing, built upon a suitable platform, adequately braced (see Part 3).

## SECTION 01 43 39 MOCK-UPS

2. Shop drawings of all materials to be manufactured or fabricated are to be furnished to the Owner and Architect two weeks prior to construction of the mock-up.

### PART 3 – EXECUTION

#### 3.1 SCHEDULE

- A. The mock-up shall be constructed as early as possible, when details of exterior have been finalized, and materials have been selected.

#### 3.2 SUPPORT FRAME

- A. Construct mock-up at Project Site where designated by Contracting Officer.
  1. Designated location shall be clear of existing vegetation, and provide excellent natural lighting of mock-up.
- B. Construct basic support frame for mock-up, with the following features:
  - 1.
  - 2.

#### 3.3 SURFACE CONSTRUCTION

- A. For each surface material provide a backing material so that finished surfaces will conform to Drawings and Specification for this Work.
  1. Provide backing for attachment of joint and trim features, and for securing of frames and similar items.
- B. Construct and install finish surface materials, trim and other features as shown on the Drawings and as specified.
  1. Conform to required surface and trim configurations, and match exactly colors and textures designated unless instructed otherwise by the Owner.
  2. Install window frames and specified glazing.
  3. Where painting is required, prepare, prime, and finish coat in accordance with requirements of the Contract Documents.

#### 3.4 PROTECTION

- A. Provide temporary protection for support framing, to last for one year, and provide protection for finish surface of equal durability (but protection shall be easily removed for viewing of the finish surface). Maintenance beyond one year will be the responsibility of others.

#### 3.5 CHANGES

- A. Changes to surface features of mock-up may be required due to availability of specified materials or fabrications.
  1. Check all materials for availability, lead time, and delivery to avoid delays.
  2. Advise Architect of any delivery difficulty immediately.
- B. Substitutions are not solicited, but alternatives will be reviewed provided they are sent with full information for comparison, and if there are compelling reasons for the substitution(s).
  1. Proposals for Substitutions shall clearly note cost and installation implications.
  2. There are to be no Substitutions without prior written consent by Architect.

#### 3.6 CLEAN UP

- A. When mock-up has been completed, revised as required, and approved as Project standard, remove all construction debris and excess materials from Site and dispose of legally.

#### 3.7 DEMOLITION

- A. Demolition and removal of the mock-up will be the responsibility of the Contractor.

END OF SECTION

## PART 1 - GENERAL

## 1.1 SECTION INCLUDES

- A. Selection and payment.
- B. Laboratory responsibilities.
- C. Laboratory reports.
- D. Limits on testing laboratory authority.
- E. Contractor responsibilities.
- F. Schedule of Inspections & Tests.

## 1.2 RELATED SECTIONS

- A. Section 00 72 00 – GENERAL CONDITIONS: Paragraph 7.7 – Tests.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: manufacturer's certificates.
- C. Section 01 45 33 - CODE-REQUIRED SPECIAL INSPECTIONS & PROCEDURES.
- D. Individual Specification Sections: Inspections and tests required, and Standards for testing.
- E. Structural Drawings: General Notes - Inspections and tests required

## 1.3 REFERENCES

- A. ASTM D3740-04a – Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ASTM E329-07 – Standard Specification for Agencies Engaged in Construction Inspections and/or Testing.

## 1.4 SELECTION &amp; PAYMENT

- A. Owner shall retain and pay for services of an independent testing laboratory to perform specified inspection and testing unless otherwise noted.
- B. Owner will retain and pay a for geotechnical engineer to take all field soil samples and do all laboratory soil testing required by the Contract Documents or as required by the City or other regulatory agency.
- C. Contractor shall pay all costs for all inspections, tests or approvals conducted by public authorities.
- D. Contractor is responsible for retesting where results of required inspections, tests or similar services do not comply with requirements of the Contract Documents, regardless of whether original test was Contractor's responsibility.
- E. Cost of retesting construction revised or replaced by Contractor is Contractor's responsibility, where required tests were performed on original construction.
- F. Supplemental testing and inspecting specifically requested by Contracting Officer through the Architect shall be paid by Owner.
- G. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

## 1.5 QUALITY ASSURANCE

- A. Comply with requirements of ASTM D3740 and ASTM E329.
- B. Laboratory: Authorized to operate in the State of Washington and approved by Contracting Officer, Architect, Structural Engineer and local building Authorities. Owner reserves the right to reject any firm for services on this Project.
- C. Laboratory Staff: Maintain a full-time registered engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

## 1.6 LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at Site. Cooperate with Architect/Engineer and Contractor in performance of services.
- C. Perform specified inspection, sampling, and testing of products in accordance with specified Standards.

- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
- F. Perform additional inspections and tests required by Architect.
- G. Attend preconstruction conferences and progress meetings as directed by Architect or Contracting Officer.
- H. Comply with and coordinate requirements of City of Tacoma Building and Land Use Services Division Special Inspection requirements.
- I. Submit a certified written report of each inspection, test or similar service to the following:
  - 1. Directly to City of Tacoma.
  - 2. General Contractor's Project Manager.
  - 3. General Contractor's Field Superintendent.
  - 4. Applicable supplier or subcontractor.
  - 5. Directly to Contracting Officer.
  - 6. Directly to Architect.
  - 7. Directly to applicable Engineer.

#### 1.7 LABORATORY REPORTS

- A. After each inspection and test, promptly submit 2 copies of laboratory report to Architect, Contracting Officer, and to Contractor.
- B. Include:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Name of inspector, testing laboratory name and address.
  - 4. Date and time of sampling inspection.
  - 5. Identification of product and Specification Section.
  - 6. Location in Project.
  - 7. Type of inspection or test.
  - 8. Date of test.
  - 9. Results of tests.
  - 10. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

#### 1.8 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop Work.

#### 1.9 CONTRACTOR RESPONSIBILITY

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
- C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the Site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- D. Notify Architect and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.
- E. Arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

#### 1.10 EVALUATION OF TESTS & INSPECTIONS

- A. Satisfactory completion of Work will be judged on results of laboratory and Site tests and inspections.
- B. If results of tests and inspections indicate Work does not meet requirements of the Contract Documents, that portion of the Work is subject to condemnation.

- C. Remove and replace Work so condemned at Contractor's expense until such Work meets requirements of the Contract Documents.

1.11 SCHEDULE OF INSPECTIONS & TESTS

- A. Includes, but not limited to:
  - 1. Section 31 20 00 EARTHWORK: Soil material, soil compaction, each type of imported material, compacted fill and subgrades under slabs and paving.
  - 2. Section 32 13 13 CONCRETE PAVING: Concrete for strength, slump, air content, temperature, and weight.
  - 3. Section 03 20 00 CONCRETE REINFORCEMENT: Reinforcing steel, visual inspection for compliance with Contract Documents.
  - 4. Section 03 30 00 CAST-IN-PLACE CONCRETE: Concrete for strength, slump, air content, temperature, and weight.
  - 5. Section 04 10 00 UNIT MASONRY: Concrete masonry.
  - 6. Section 04 20 00 CLAY UNIT MASONRY: Clay unit masonry.
  - 7. Section 05 12 00 STRUCTURAL STEEL: High-strength bolts, tension-control bolts, welding of structural steel connections.
  - 8. Any item required to be tested per governing regulations and ordinances.

END OF SECTION



## SECTION 02 41 19 SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Perform selective demolition in accordance with the Contract Documents.
- B. Coordinate timing of demolition.
- C. Drawings merely indicate what is to be removed.
- D. Except for hidden conditions, where new Work is shown in place of existing, it shall be assumed that the existing improvements will be removed even though not shown on Drawings.
- E. The Drawings are complementary and what is shown to be removed on Engineering Drawings shall be as binding a Project requirement as though it was also shown on Architectural Drawings.
- F. Provide fire safety during demolition as required by Chapter 14 of the International Fire Code.
- G. Types of Selective Demolition Work: The selective removal and subsequent offsite disposal of the following:
  - 1. Preparation of existing concrete slab to receive new floor finishes.
  - 2. Cutting new openings into existing concrete slabs.
  - 3. Removal of existing interior partitions, includes doors and frames.
  - 4. Plumbing, mechanical and electrical Work.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 31 13 - PROJECT COORDINATION: Coordination of the Work.
- C. Section 01 35 15 - SPECIAL REQUIREMENTS - PENETRATIONS & ANCHORS: Penetrations through and anchoring to existing structure.
- D. Section 01 35 20 - SPECIAL OWNER POLICIES & PROCEDURES: Hot Work, Infection Control.
- E. Section 01 50 00 - TEMPORARY FACILITIES & CONTROLS: Dust control, temporary construction partitions, temporary barricades.
- F. Section 01 73 29 - CUTTING & PATCHING: Cutting and patching.
- G. Section 31 10 00 - SITE CLEARING: Site clearing.

#### 1.3 REFERENCES

- A. International Code Council, Inc. (ICC):
  - 1. International Fire Code (IFC), as amended by State of Washington, Chapter 14, "Fire Safety During Construction and Demolition."

#### 1.4 DEFINITIONS

- A. Selective Demolition: Consists of the removal of portions of an existing building or structure to remain.

#### 1.5 PROJECT / SITE CONDITIONS

- A. Condition of Structure: Bidder shall examine job conditions and assume responsibility for the amount of additional selective demolition and restoration Work that will be required to accommodate new Work.
- B. Occupancy: Spaces immediately adjacent to areas of demolition will be occupied during demolition operations. Provide construction partitions to separate occupied areas from demolition.

#### 1.6 DEMOLITION

- A. Protection: Provide temporary barricades and other forms of protection under the provisions of Section 01 50 00 as required to protect Owner's personnel and general public from injury due to selective demolition Work.
  - 1. Protect from damage existing finish Work that is to remain in place and becomes exposed during demolition operations.

## SECTION 02 41 19 SELECTIVE DEMOLITION

2. The heating and ventilation systems in existing buildings shall be maintained during the course of the Work. Cap off supply outlets as required to maintain negative pressure inside demolition and construction areas.
3. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing building.
4. Remove protections at completion of Work.
- B. Utility Services: Maintain existing utilities to remain, keep in service and protect against damage during demolition operations.
  1. Work inside existing building, requiring any concrete cutting or brazing, grinding, welding or soldering of metals, or any Work producing gases or particulate capable of activating ionization or smoke / heat detectors: See Hot Work Permits, Section 01 35 20.
  2. Take precautions to avoid cutting of existing pipe, conduit or ductwork serving any existing area. Provide and schedule relocations or by-passes as required to alleviate any interruptions of service. Schedule minor or major shutdowns in accordance with Section 01 31 13.
- C. Perform selective demolition Work in a systematic manner. Use such methods as required to complete Work indicated on Drawings in accordance with Demolition Schedule and governing regulations.
- D. Concrete: Demolish in small sections. Cut masonry at juncture with construction to remain, using power-driven saw; then remove masonry beyond saw cut.
- E. If unanticipated structural, mechanical or electrical elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit RFI to the Architect in written, accurate detail. Pending receipt of directive from the Architect or the Contracting Officer, rearrange Selective Demolition Schedule as necessary to continue overall job progress without delay.
- F. Salvage: Items to be salvaged for reuse are indicated on drawings. Items to be salvaged for Owner are indicated on Drawings or Owner will remove prior to demolition. Balance becomes Contractor's property to dispose of.
- G. Disposal of Demolished Materials: Remove debris, rubbish and other materials resulting from demolition operations from Project Site. Transport and legally dispose of materials at a licensed solid waste disposal facility.
- H. Clean-Up and Repair:
  1. Repair demolition performed in excess of that required. Return structure and surfaces to remain to condition existing prior to commencement of selective demolition Work. Repair adjacent construction or surfaces soiled or damaged by selective demolition.
  2. Upon completion of demolition Work, remove tools, equipment and demolished materials from Project Site. Remove protections and vacuum interior areas.

END OF SECTION



## SECTION 03 11 00 CONCRETE FORMING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Design, construction, and safety of formwork for cast-in-place concrete.
- B. Furnish and install required formwork ready for pouring of concrete.
- C. Strip and dispose of formwork.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 36 00 - DESIGN-BUILD REQUIREMENTS: Additional requirements.
- C. Section 03 21 00 - REINFORCING STEEL: Placement of reinforcing steel.
- D. Section 03 30 00 - CAST-IN-PLACE CONCRETE: Placing concrete and finish requirements.
- E. Section 03 45 00 - ARCHITECTURAL PRECAST CONCRETE. Placing concrete.
- F. Section 03 37 00 - SHOTCRETE: Option.
- G. Section 05 50 00 - METAL FABRICATIONS: Items to be embedded.
- H. Section 31 20 00 - EARTHWORK: Capillary break under slab-on-grade.

#### 1.3 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI SP-4, Formwork for Concrete, 7th edition.
  - 2. ACI 117, Specifications for Tolerances for Concrete Construction and Materials.
  - 3. ACI 347, Guide to Formwork for Concrete.

#### 1.4 QUALITY ASSURANCE

- A. Design, erect, shore, brace, and maintain formwork in accordance with ACI SP-4.
- B. Tolerances: Within limits of ACI 117.
- C. Formwork Class of Surface: Comply with Class of Finish requirements of ACI 347 Table 3.1 unless otherwise indicated, as follows:
  - 1. Class A: All surfaces exposed to public view.
  - 2. Class B: All surfaces receiving coarse textured coating such as plaster or stucco.
  - 3. Class C: All other surfaces.

### PART 2 - PRODUCTS

#### 2.1 FORM MATERIALS

- A. Wood, metal, or plastic as arranged by Contractor. Forming material shall be compatible with finish requirements for concrete to be left exposed or to receive decorative finish.

#### 2.2 ACCESSORIES

- A. Release agents used shall be compatible with finish requirements.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Unless new, clean forms of loose concrete and other debris from previous use and repair to proper condition.

#### 3.2 RE-USE OF FORMS

- A. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints.
- B. Align and secure joint to avoid offsets.
- C. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

### 3.3 INSTALLATION

#### A. Forms -

1. Conform to shape, lines, and dimensions indicated on Drawings and concrete tolerances specified in Section 03 30 00.
2. Be sufficiently tight to prevent leakage and fabricated for easy removal without requiring hammering or prying against concrete surfaces.
3. Be properly braced and tied. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Securely brace temporary openings and set tightly to prevent loss of concrete mortar.
4. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only.
5. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
6. Provide temporary openings at base of tall forms to facilitate cleaning, placement of concrete and inspection. Locate temporary openings on forms at inconspicuous locations.
7. Provide openings in concrete formwork to accommodate Work of other trades. Determine size and location of openings, recesses and chases from trades providing such items.
8. Make proper form adjustments before, during, and after concreting.

#### B. Accessories -

1. Provide for installation of inserts, templates, fastening devices, and other accessories to be set in concrete prior to placing.
2. Accurately place and securely support items built into forms.

#### C. Form-Coating Material -

1. Coat contact surfaces with a form-coating material before reinforcement is placed.
2. Apply in accordance with manufacturer's printed instructions.
3. Do not allow excess form-coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed.
4. Coat steel forms with non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

### 3.4 REMOVAL OF FORMS

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F for 48 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations.
- B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than three (3) days and until concrete has attained 75 percent of its design minimum compressive strength at 28 days.
1. Method to Determine Potential Compressive Strength: Test field-cured specimens representative of concrete location or members.
  2. If no 3-day test specimens are tested, maintain form work for seven (7) days.
- C. Form facing material may be removed four (4) days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

### 3.5 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in Work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

END OF SECTION

## SECTION 03 21 00 REINFORCING STEEL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnishing, bending, and installing reinforcing as described in Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 03 11 00 - CONCRETE FORMING.
- D. Section 03 30 00 - CAST-IN-PLACE CONCRETE: Placing concrete.
- E. Section 03 45 00 - ARCHITECTURAL PRECAST CONCRETE. Placing concrete.
- F. Section 03 37 00 - SHOTCRETE: Option.
- G. Section 05 50 00 - METAL FABRICATIONS: Items to be embedded.
- H. Section 07 26 00 - VAPOR RETARDERS: Under-slab vapor retarder.
- I. Section 31 20 00 - EARTHWORK: Capillary break under slab-on-grade.
- J. STRUCTURAL DRAWINGS: Additional requirements.

#### 1.3 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 315, Details and Detailing of Concrete Reinforcement.
  - 1. ACI 318, Building Code Requirements for Reinforced Concrete.
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
  - 1. ASTM A706/A706M, Standard Specification for Low-Allow Steel Deformed and Plain Bars for Concrete Reinforcement.
  - 1. ASTM A775/A775M, Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
- C. Concrete Reinforcing Steel Institute (CRSI):
  - 1. Manual of Standard Practice, 27th Edition.

#### 1.4 SUBMITTALS

- A. Submittal Procedure: See Section 01 33 00.
- B. Product Data: For each type of product indicated.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing and supports for concrete reinforcement.

#### 1.5 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of Codes, Specifications and Standards listed in Article 1.3 of this Section, except where more stringent requirements are shown or specified.
- B. Quality Control: Owner will employ a testing and inspection agency to perform inspections as scheduled on Structural Drawings - General Notes.

#### 1.6 DELIVERY, STORAGE & HANDLING

- A. Reinforcing steel shall be free of rust, scale, or other coating at time of delivery and placing.
- B. Deliver bars separated by size and tagged with manufacturer's heat or test identification number.
- C. Properly protect reinforcing bars on site after delivery.

## PART 2 - PRODUCTS

### 2.1 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A615, grades as shown on Structural Drawings.
- B. Welded Wire Fabric: ASTM A185, welded steel wire fabric, sizes as shown on Structural Drawings.
- C. Epoxy Coated Bars: ASTM A775. Handle bars carefully to avoid damage to coating. Field repairs to minor chips or cracks in coating may be made with two-part epoxy.
- D. Steel Wire: ASTM A82, plain, cold-drawn steel.
- E. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI recommendations, unless otherwise acceptable.
  - 1. For slabs-on-grade, use concrete brick supports.
  - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
- F. Reinforcing Couplers: Type 2 per Section 21.2.6 of ACI 318. Subject to compliance with requirements, provide one of the following:
  - 1. Cadweld or Lenton by Erico International Corp. [www.erico.com](http://www.erico.com)
  - 2. MBT Bar-Lock, No-Slip by Fox-Howlett Industries, Inc.
  - 3. Approved Substitute under the provisions of Section 01 25 13.
- G. Concrete Inserts: Threaded dowel bar Substitution capable of developing the full tensile capacity of the bar. Subject to compliance with requirements, provide one of the following:
  - 1. Richmond Screw Anchor Co., Inc.
  - 2. Approved Substitute under the provisions of Section 01 25 13.

## PART 3 - EXECUTION

### 3.3 PLACING REINFORCEMENT

- A. Comply with CRSI "Manual of Standard Practice" for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by form work, construction or concrete placement operations. Locate and support reinforcing by chairs, runners, bolsters, spacers and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

### 3.5 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into Work, anchorage devices and other embedded items required for other Work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

END OF SECTION

## SECTION 03 30 00 CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Cast-in-place concrete Work in accordance with the Contract Documents.
- B. Quality of concrete used on Project but furnished under other Sections.
- C. Submittals.
- D. Concrete materials.
- E. Mix designs.
- F. Concrete placement.
- G. Finishing of formed surfaces.
- H. Concrete curing.
- I. Quality control testing during construction.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 45 21 - TESTING LABORATORY SERVICES: Testing.
- D. Section 01 45 10 - VAPOR EMISSION & ALKALINITY TESTING: Testing.
- E. Section 03 11 00 - CONCRETE FORMING.
- F. Section 03 21 00 - REINFORCING STEEL.
- G. Section 03 35 10 - VAPOR EMISSION REDUCER: Application of vapor emission reducer to concrete slabs scheduled to receive floor finish.
- H. Section 03 45 00 - ARCHITECTURAL PRECAST CONCRETE.
- I. Section 03 37 00 - SHOTCRETE: Option for basement walls.
- J. Section 03 54 16 - CEMENTICIOUS TOPPING: Material for repair of larger areas.
- K. Section 07 26 00 - VAPOR RETARDERS: Under-slab vapor retarder and above-slab moisture-retaining cover.
- L. Section 31 20 00 - EARTHWORK: Capillary break under slab-on-grade.
- M. STRUCTURAL DRAWINGS: General Notes - Additional requirements.

#### 1.3 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 301, Specifications for Structural Concrete.
  - 2. ACI 302.1R, Guide for Concrete Floor and Slab Construction.
  - 3. ACI 304, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
  - 4. ACI 305R, Hot Weather Concreting.
  - 5. ACI 306.1, Cold Weather Concreting.
  - 6. ACI 309R, Guide for Consolidation of Concrete.
  - 7. ACI 311.4R-05: Guide for Concrete Inspection.
  - 8. ACI 318, Building Code Requirements for Reinforced Concrete.
  - 9. ACI Document SP-66, Detailing Manual.
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM C33, Standard Specification for Concrete Aggregates.
  - 2. ASTM C94/C94M, Standard Specification for Ready-Mix Concrete.
  - 3. ASTM C150, Standard Specification for Portland Cement.
  - 4. ASTM C260, Standard Specification for Air-Entraining Admixtures for Concrete.
  - 5. ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - 6. ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.
  - 7. ASTM C595, Standard Specification for Blended Hydraulic Cements.
  - 8. ASTM C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
  - 9. ASTM C989, Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.

10. ASTM C1017/C1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
  11. ASTM C1218/C1218M, Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
  12. ASTM D1752, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers For Concrete Paving and Structural Construction.
  13. ASTM E1155, Test Method for Determining  $F_F$  Floor Flatness and  $F_L$  Floor Levelness Numbers.
- C. International Code Council, Inc. (ICC):
1. International Building Code (IBC), 2006 Edition as amended by State of Washington, Chapter 19.

#### 1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the referenced Codes, Specifications and Standards, except where more stringent requirements are shown or specified.
- B. Quality Control: The Owner will employ a testing laboratory to perform detailed tests as specified in Part 3 of this Section.
- C. Pre-Installation Conference:
1. At least 30 days prior to start of the concrete construction schedule, conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures to achieve the required concrete construction, including architectural concrete finish and floor slabs.
  2. Require responsible representatives of every party who is concerned with the concrete work to attend the conference, including but not limited to the following:
    - a. Contractor's superintendent.
    - b. Testing agency responsible for field quality control.
    - c. Concrete subcontractor, if applicable.
    - d. Cement finishing subcontractor, if applicable.
    - e. Ready-mix concrete producer.
    - f. Admixture manufacturer(s).
    - g. Concrete pumping contractor.
    - h. Contracting officer.
    - i. Structural Engineer of Record.
    - j. Curing and sealing agent manufacturer's technical representative.
  3. Minutes of the meeting shall be recorded, typed, printed and distributed to all parties within five (5) days of the meeting. One copy of the minutes shall also be transmitted to the Architect.
- D. Moisture Vapor Emissions & Alkalinity Testing:
1. Measure moisture vapor emissions and alkalinity of below-grade, on-grade and above-grade concrete slabs to receive floor finish in accordance with the requirements of Section 01 45 10.
  2. Acceptable test results , unless otherwise indicated by flooring manufacturer:
    - a. Moisture Vapor Emission Testing: Not to exceed 3 pounds of water vapor per 1,000 square feet per 24 hours (3 lbs/1000 ft<sup>2</sup>/24h).
    - b. Alkalinity Testing: pH not less than 5 nor greater than 9.

## 1.5 SUBMITTALS

- A. Submit in accordance with the provisions of Section 01 33 00.
- B. Design Mixes: For each concrete mix, include alternate mix designs when characteristics of materials, Project conditions, weather, test results or other circumstances warrant adjustments.
  - 1. Provide separate cover sheet for each mix design, similar to following: [09/2608/-]

CONCRETE DESIGN MIX	
Date	
Name of Batch Plant	
Project Name	Good Samaritan Hospital Patient Care Tower Shell & Core
Project Location	Puyallup, WA
Mix Design Designation	
Location(s) Where Design Mix Is To Be Used	

- C. Product Data: For each type of product indicated.
- D. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.
- E. Delivery Tickets: require mix plant to furnish delivery ticket for each batch of concrete. Keep delivery tickets at job site for use of Contracting Officer or his representatives. Tickets shall show the following:
  - 1. Name of ready-mix batch plant.
  - 2. Serial number.
  - 3. Date and truck number.
  - 4. Contractor name.
  - 5. Project name and location.
  - 6. Specific class or designation of concrete in conformance with that employed in Project Specification.
  - 7. Volume of concrete.
  - 8. Time loaded.
  - 9. Type, name, and volume of admixture used.
  - 10. Volume and type of cement.
  - 11. Total water content.
  - 12. Volume of water added by receiver of concrete with his initials.
- F. Laboratory test reports

## PART 2 - PRODUCTS

### 2.1 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Type I or II. Use one brand of cement throughout Project, unless otherwise acceptable to Architect.
- B. Fly-Ash: ASTM C 618, Type C or Type F, maximum loss of ignition shall be one per cent.
- C. Normal Weight Aggregates: ASTM C33, and as herein specified. Provide aggregates from a single source for exposed concrete.
  - 1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
  - 2. Local aggregates not complying with ASTM C33 may be used where special tests or actual service have shown to produce concrete of adequate strength and durability.
- D. Water: Drinkable.

- E. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "AEA-92 and Air Mix 200" The Euclid Chemical Co.
    - b. "Sika Aer" Sika Corp.
    - c. "MB-VR" or "MB-AE" Master Builders
- F. Water-Reducing Admixture: ASTM C494, Type A, and containing not more than 0.1 percent chloride ions.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Eucon WR-75" or "Eucon WR-91" The Euclid Chemical Co.
    - b. "Pozzolith Normal" or "Polyheed" Master Builders, Inc.
    - c. "Plastocrete 160" Sika Corp.
- G. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C494, Type F or Type G and containing not more than 0.05 percent chloride ions.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Eucon 37" The Euclid Chemical Co.
    - b. "Sikament 300" Sika Chemical Corp.
    - c. "Rheobuild 1000" Master Builders
- H. Non-Chloride, Non-Corrosive Accelerating Admixture: "Accelguard 80" The Euclid Chemical Co.
- I. Water-Reducing, Retarding Admixture: ASTM C494, Type D, and containing not more than 0.05 percent chloride ions.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Eucon Retarder 75" The Euclid Chemical Co.
    - b. "Pozzolith Retarder" Master Builders

## 2.2 RELATED MATERIALS

- A. Concrete Curing Agent:
  - 1. Exterior walks and floor slabs to be left exposed: Ashford Formula by Curecrete Chemical Company, Inc. (425) 485-8373. No substitutions.
  - 2. Formed surfaces: ASTM C309, Type 1, Class B.
- B. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application on fresh concrete.
- C. Bonding Compound: Polyvinyl acetate type. Subject to compliance with requirements, provide one of the following:
  - a. "Weldcrete," Larson Products Corp.
  - b. "Euco Weld," The Euclid Chemical Co.
  - c. Approved equal.
- D. Dowel Bar Epoxy Grout: See General Notes on Structural Drawings.
- E. Underlayment Compound: Trowel grade cementitious base compound for applications from 1/2 inch thick to feathered edges. The material specified below is intended for local floor repairs. For larger areas, material specified under Section 03 54 16 may be used.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "SD-F Feather Finish" Ardex, Inc.
    - b. "Feather Spred" Raeco, Inc.
- F. Fiber Reinforcement: Nurlon as manufactured by Smith Chemical Corporation, Distributor: Fiberwest (800) 678-0221, Nycon (800) 456-9266.
- G. Waterstop: Vinylflex Corporation "Split Ribbed Kwik-Tie RSB9-12", [www.vinylflex.com](http://www.vinylflex.com), or approved equal.
- H. Expansion Joint Filler Strips: ASTM D1752, Type II.
  - 1. Where required to support expansion joints, sealant joints and joints indicated as "preformed joint filler," use Type 1 gray sponge rubber filler strips.
- I. Semi-Rigid Epoxy Floor Joint Sealant: Two component, self-leveling pourable sealant with Shore A hardness of 70 to 90.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Sikadur 51SL" Sika Corp.
    - b. "Euco 700" Euclid Chemical Co.



- c. Approved equal.

## 2.5 PROPORTIONING & DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.
1. Use of fly ash shall not exceed 20 percent of cement content by weight.
  2. Comply with additional requirements indicated on Structural Drawings, General Notes.
- B. Submit written Reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work.
1. Do not begin concrete production until mix design Submittal is returned by Architect with appropriate action mark allowing Contractor to proceed.
- C. Adjustment to Concrete Mixes: Adjustments to Mix design may be requested by Contractor under provisions of Section 00 90 00, Contractor's Request for Design Deviation, when characteristics of materials, job conditions, weather, test results or other circumstances warrant, at no additional cost to Owner, and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.
- D. Concrete Fill: Mix concrete fill for steel pan-type stairs and platforms in proportions, by weight, of one part Portland cement, 1-1/2 parts sand and 3 parts coarse aggregate. Grade coarse aggregate from 1/8 inch with at least 95 percent passing a 3/8 inch sieve and not more than 10 percent passing a No. 8 sieve. Mix in one pound of fiber reinforcement per cubic yard of concrete at the time concrete is batched.
- E. Admixtures: "Provide" is mandatory. "Use" defines Contractor's options.
1. Provide Type A water-reducing admixture or Type F high-range water-reducing admixture (super plasticizer) in slab on grade concrete.
  2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F.
  3. Use high-range, water-reducing admixture in pumped concrete, concrete for slabs, architectural concrete, concrete required to be watertight and concrete with water / cement ratios below 0.50.
  4. Use air-entraining admixture in exterior exposed concrete, to provide 5 percent  $\pm$  1-1/2 percent entrained air by volume.
  5. Use Type A or Type A / F water reducing admixture for all exterior slabs, paving and walks except as otherwise specified.
  6. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
  7. Slump limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
    - a. Ramps, slabs and sloping surfaces: Not more than 3 inches.
    - b. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
    - c. Concrete containing HRWR admixture (super plasticizer): Not more than 8 inches after addition of HRWR to verified 2 inch to 3 inch slump concrete.
    - d. Other concrete: Not less than 1 inch nor more than 4 inches, unless specifically authorized by Architect or Structural Engineer.

## 2.6 CONCRETE MIXING

- A. Batch Tickets: Provide tickets for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity and amount of water introduced.

- B. Ready-Mix Concrete: Comply with requirements of ASTM C94, and as herein specified.
  - 1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required.
  - 2. When air temperature is between 85 degrees F and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Verify that damaged sections of under-slab vapor retarder have been properly repaired in accordance with Section 07 26 00.
- B. Formwork, reinforcing steel, inserts, bolts, boxes, templates, pipes, conduits, and other accessories shall be installed by appropriate Section and inspected prior to pouring.
- C. Moisten wood forms immediately before placing concrete where form coatings are not used.
- D. Remove water and debris from space to be poured.

#### 3.2 JOINTS IN SLABS

- A. Construction Joints: Locate and install construction joints so as not to impair strength and appearance of the structure.
  - 1. Expansion joints: Joints that interrupt concrete pour, discontinue reinforcement, but provide interlock to prevent differential vertical settlement.
  - 2. Contraction (control) joints: Joints installed to control cracking or pour joints where reinforcement is continuous.
- B. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- C. Construct isolation joints in slabs on grade at points of contact between slab on grade and vertical surfaces, such as column pedestals, foundation walls, grade beams and elsewhere as indicated.
- D. Construct contraction (control) joints in slabs on grade as shown. Use saw cuts 1-1/4 inch deep, unless otherwise indicated.
  - 1. Slab on grade: Form contraction joints in floor slabs by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate. Seal sawed joints with semi-rigid epoxy floor joint sealant.

#### 3.3 CONCRETE PLACEMENT

- A. Pre-Placement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel and items to be embedded or cast in. Notify other crafts to permit installation of their Work; cooperate with other trades in setting such Work. Moisten wood forms immediately before placing concrete where form coatings are not used.
- B. General:
  - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
  - 2. Apply temporary protective covering to lower 2 feet of finished walls adjacent to floor slab pours and similar conditions, and guard against spattering during placement.
- C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

- D. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, redding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309 recommended practices.
- E. Do not use vibrators to transport concrete inside forms.
  - 1. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine.
  - 2. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer.
  - 3. Do not insert vibrators into lower layers of concrete that have begun to set.
  - 4. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- F. Concrete shall not free fall more than 5 feet without prior written approval of Structural Engineer of Record.
- G. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing within a panel or section is complete.
- H. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into comers.
- I. Bring slab surfaces to correct level with straightedge and strike-off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
- J. Maintain reinforcing in proper position during concrete placement operations.

#### 3.4 COLD WEATHER PLACEMENT

- A. Protect concrete Work from physical damage or reduced strength which could be caused by frost, freezing actions or low temperatures, in compliance with ACI 306, as herein specified, and the requirements indicated on Structural Drawings, General Notes.
  - 1. When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F, and not more than 80 degrees F at point of placement.
  - 2. Do not use frozen materials or materials containing ice or snow.
  - 3. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 4. Do not use calcium chloride, salt or other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
  - 5. Concrete may require protection for 4-7 days after pouring.
    - a. If temperatures remain below 32 degrees F, cover freshly poured concrete with insulating blankets.
    - b. If temperatures are not less than 30 degrees F at night and above 32 degrees F during the day, Kraft Paper with complete coverage may be used in lieu of insulating blankets.

#### 3.5 HOT WEATHER PLACEMENT

- A. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified. Precaution methods include, but not limited to the following:
  - 1. Cool ingredients before mixing to maintain concrete temperature below 90 degrees F at time of placement.
  - 2. Mixing water may be chilled, or chopped ice may be used to control temperature, provided equivalent water volume of ice is calculated into total amount of mixing water.
  - 3. Liquid nitrogen may be used to cool concrete at Contractor's option.
  - 4. Cover reinforcing steel with water-soaked burlap if reinforcing becomes too hot, so that steel temperature will not exceed ambient air temperature immediately before embedment in concrete.

5. Fog spray forms, reinforcing steel and subgrade just before placing concrete.
  6. Use water-reducing retarding admixture when required by high temperature, low humidity or other adverse placing conditions.
  7. Use special curing methods as specified herein.
  8. Reduction of pour size.
  9. Placing concrete at night.
- B. When the estimated Rate of Evaporation exceeds 0.2 psf per hour the placement shall be considered a "hot weather" placement.
1. The Contractor shall estimate the Rate of Evaporation using Figure 2.1.5 of ACI 305.
  2. Precautions against plastic shrinkage are required. Precautions used by Contractor vary depending on the factors associated with water evaporation. See precaution methods under Paragraph 3.5 A of this Section.

### 3.6 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish Work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
- B. Grout-Cleaned Finish: This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch tie holes and defective areas, with fins or projections completely removed and smoothed. Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours. Provide this finish for exterior exposed formed surfaces.
- C. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process. For sides of curbs and housekeeping pads.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.7 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic tile or another thin-film-finish coating system.
  2. Finish surfaces to the following tolerances, according to ASTM E1155, for a randomly trafficked floor surface.
    - a. Carpeted slabs: Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.

- b. Resilient and ceramic floor finishes: Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs on grade.
- D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic tile is to be installed. While concrete is still plastic, slightly scarify surface with a fine broom.
  - 1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.
- E. Broom Finish: Apply a broom finish to exterior concrete walks, steps and ramps, and elsewhere as indicated.
  - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application. Provide edge tooling as indicated.

### 3.8 CONCRETE PROTECTING & CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry or windy conditions cause moisture loss approaching 0.2 pounds per square foot x height before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings and other surfaces.
- E. Curing Methods for Unformed Surfaces: Perform curing of concrete by vapor emission reducer, curing and sealing compound, by moisture-retaining cover curing and as herein specified. Start curing as soon as free water is disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 72 hours. Avoid rapid drying at end of curing period.
  - 1. Moisture-cover curing: Use this method for slabs to receive ceramic tile or concrete stain. Cover concrete surfaces with geotextile felt for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  - 2. Vapor emission reducer: Apply to floor slabs to receive finish flooring or roofing in strict accordance with the provisions of Section 03 35 10.
  - 3. Curing and sealing compound: Apply to floor slabs to be left exposed and exterior walks and paving. Install in strict accordance with manufacturer's instructions.
- F. Protection: Do not allow any foot traffic on freshly poured floors for at least 24 hours. Delay other traffic on floors as long as possible.

### 3.9 MISCELLANEOUS CONCRETE ITEMS

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.
- C. Housekeeping Pads: Provide equipment bases, as shown on drawings. Set anchor bolts for equipment to template at correct elevations, complying with certified diagrams templates of manufacturer furnishing machines and equipment.

- D. Expansion Joint Fillers: Set flush with surface or recess from surface as indicated, leaving minimum exposure at completion. Install to full depth and widths of joints.

### 3.10 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect. Cut out honeycombs, rock pockets and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
- B. For exposed-to-view unpainted surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
- C. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
- D. Repair of Slab Surfaces: Test slab surfaces, as specified in "Quality Control" for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas in shored slabs and slabs on grade as herein specified. Test surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
  - 1. Repair finished slab surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01 inch wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets and other objectionable conditions.
  - 2. Correct high areas in surfaces by grinding, after concrete has cured at least 14 days.
  - 3. Correct low areas in surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Self leveling underlayment may be used when acceptable to Architect.

### 3.11 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. Special inspection, sampling, and testing for quality control during placement of concrete will be performed by the Testing and Inspection Agency and shall include the following, as directed by Architect.
- B. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
  - 1. Slump: ASTM C143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
  - 2. Air content: ASTM C231 pressure method; one for each day's pour of each type of air entrained concrete.
  - 3. Concrete temperature: Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time a set of compression test specimens made.
  - 4. Compression test specimen: ASTM C31; one set of 4 standard cylinders for each compressive strength test. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required. One

- specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
5. Frequency of compression strength tests: IBC Section 1905.6.2.
- C. Strength Requirements and Compliance:
1. Test results shall be reported in writing to Structural Engineer of Record, Architect, concrete manufacturer and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength and type of break for both 7 and 28 day tests.
  2. Acceptance of tests: IBC Section 1905.6.3.3.
  3. Non-destructive testing: Impact hammer, sonoscope or other non-destructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- D. Floor Flatness and Levelness: Testing is not normally required. If Architect suspects floor surface is not in compliance, he may request the Testing and Inspection Agency to test the suspect floor surfaces.
- E. Enforcement:
1. When actual non-compliance and / or ominous trends are observed by the Testing and Inspection Agency, such information will be relayed to Contractor and concrete supplier and confirmed promptly in writing. Such warning shall be heeded by concrete supplier who shall take immediate appropriate action to correct deficiency.
  2. If non-compliance occurs, producer will be warned to take immediate corrective action. Test results of concrete furnished subsequent to such a warning shall comply. Test results indicating noncompliance after one warning will be sufficient cause for Architect to refuse to permit additional concrete to be furnished by the non-complying producer.
  3. Additional tests: The Testing and Inspection Agency will make additional tests of in-place concrete as directed by Structural Engineer of Record or Building Official in accordance with IBC Section 1905.6.5, when test results indicate specified concrete strengths and other characteristics have not been attained in the structure. Testing and Inspection Agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for tests conducted, and additional testing as may be required, when unacceptable concrete is verified.
  4. The testing and inspection agency shall notify Contractor's site superintendent immediately of concrete with water added in excess of the allowance listed on the batch ticket.
    - a. Contractor shall reject concrete with water added in excess of the allowance listed on batch ticket.
  5. Corrective Work:
    - a. If results of additional testing show that the actual strength of the concrete is sufficiently low as to jeopardize performance of the structure, the Structural Engineer may require that the unacceptable concrete be removed from the structure and be replaced at no additional cost to the Owner.
    - b. If floor flatness and levelness do not meet specified criteria, provide surface repairs to bring floor slab to compliance and retest.

END OF SECTION





## SECTION 03 35 10 CONCRETE FLOOR SLAB PREPARATION

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Preparation of concrete floor slabs scheduled to receive floor coverings, including:
  - 1. Drying concrete slab to required moisture vapor transmission rate.
  - 2. Correcting slabs that are rough or out-of-tolerance.
  - 3. Correcting slabs that exceed required vapor emission rates.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: for submittal of product data.
- C. Section 01 45 10 – VAPOR EMISSION & ALKALINITY TESTING: for testing.
- D. Section 03 30 00 – CAST-IN-PLACE CONCRETE: for concrete substrate flatness tolerances.

#### 1.3 REFERENCES

- A. Reference Standards shall be latest adopted edition.
- B. ASTM International (ASTM):
  - 1. ASTM C1059, Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
  - 2. ASTM F710, Standard Practice for preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: If tests indicate that vapor emission retarder is required, submit product data for proposed vapor emission retarder(s) for Architect's review.
- C. If vapor emission retarder is required, submit letter by each floor coating or covering manufacturer that proposed vapor emission retarder product(s) is approved for use under their respective floor coating or covering products scheduled for use on this Project.
  - 1. Approval letter(s) shall be dated after date that moisture vapor emission tests were conducted.

#### 1.5 PROJECT / SITE CONDITIONS

- A. Roofing system must be installed and all exterior openings closed in.
- B. Areas shall be heated and dry.

#### 1.6 WARRANTY, VAPOR EMISSION REDUCER

- A. Manufacturer shall furnish written warranty with a \$1,000,000 insurance binder adding Owner as additional loss payee.
- B. A trained applicator shall apply the product, or a technician must be on Site during spraying applications for verification to receive 10-year warranty on all floor finishes.
- C. When a floor finish system is installed on below-grade, on-grade, or above-grade concrete slab treated with the product according to manufacturer's instruction, manufacturer shall warranty floor covering system against delamination due to negative-side moisture migration or moisture-born contaminants for a period of ten (10) years from the date of original installation. Warranty shall cover both labor and materials necessary to repair or replace floor finish if repairs cannot be made.

### PART 2 - PRODUCTS

#### 2.1 DRYING EQUIPMENT

- A. Provide fans, heaters, dehumidifiers, etc. required to dry out concrete floor slabs to required
  - 1. Heating equipment is limited to electric heaters or indirect-fired units for gas, oil or kerosene with exhaust piped directly to building exterior.
  - 2. Direct-fired gas, oil or kerosene heaters are not allowed.

## SECTION 03 35 10 CONCRETE FLOOR SLAB PREPARATION

### 2.2 TROWELABLE UNDERLAYMENT

- A. Portland cement-based underlayment formulated specifically for patching and filling concrete slabs, 4,200 psi compressive strength; capable of feather edge; not adversely affected by moisture or alkali.
- B. Subject to compliance with requirements, provide products by one of the following:
  - 1. Ardex SD-P InstatPatch by Ardex Engineered Cements, [www.ardex.com](http://www.ardex.com).

### 2.3 UNDERLAYMENT COMPOUND

- A. Trowel grade cementitious base compound for applications from 1/2 inch thick to feathered edges. The material specified below is intended for local floor repairs. For larger areas, material specified under Article 2.2 of this Section may be used.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. SD-F Feather Finish by Ardex Engineered Cements, [www.ardex.com](http://www.ardex.com).
    - b. Feather Spred by Raeco, Inc., [www.raecoinc.com](http://www.raecoinc.com).

### 2.4 VAPOR EMISSION RETARDER

- A. The need for a vapor emission retarder shall be determined by Contractor based on the following:
  - 1. Contractor's Construction Progress Schedule.
  - 2. Contractor's ability to manage installation and protection of under-slab vapor retarder at concrete slabs-on-grade.
  - 3. Concrete is sufficiently dry and water vapor emission rate meets requirements of primary floor coating or covering manufacturer.
- B. If required, selection of vapor emission retarder product(s) shall be based on moisture vapor emission test results and limitations / requirements of specific products by vapor emission retarder manufacturer.
- C. Select vapor emission retarder product approved in writing by floor coating and floor covering manufacturers for use under their products scheduled for this Project.

### 2.5 ACCESSORY MATERIALS

- A. Bonding Agent: ASTM C1059, Type II, non-re-dispersible, acrylic emulsion or styrene butadiene.

## PART 3 - EXECUTION

### 3.1 COORDINATION

- A. Contractor shall review, coordinate and accommodate Work of other trades that interface with, affect or are affected by Work of this Section to ensure efficient execution of the overall Work.
- B. Coordinate concrete placement, floor finish, curing and drying requirements with Section 03 30 00.

### 3.2 DRYING CONCRETE SLAB

- A. General: Manage and control variables affecting dry-out of concrete slabs as required to maintain Contractor's Construction Progress Schedule.
- B. Drying Concrete Slabs:
  - 1. Concrete slab shall be fully cured and reached design strength.
  - 2. Dry out new or existing concrete slabs-on-grade and elevated concrete slabs using fans, heaters, and dehumidifiers until moisture content and moisture vapor emission rate meet requirements of floor coating or covering manufacturers.
    - a. Where liquid curing compound has been used to cure concrete floor slabs, remove any remaining compound from substrate using rotary sander or other mechanical means to allow complete drying out of concrete slab.

### 3.3 TESTING

## SECTION 03 35 10 CONCRETE FLOOR SLAB PREPARATION

- A. Moisture Vapor Emission and Alkalinity Testing: After slab dry-out operations are complete, perform tests under provisions of Section 01 45 10.
  - 1. Measure moisture vapor emissions and alkalinity of below-grade, on-grade and above-grade concrete slabs to receive floor finish in accordance with the requirements of Section 01 45 10.
  - 2. Acceptable test results, unless otherwise indicated in flooring manufacturer's published product data:
    - a. Moisture Vapor Emission Testing: Not to exceed 3 pounds of water vapor per 1,000 square feet per 24 hours (3 lbs/1000 ft<sup>2</sup>/24h).
    - b. Alkalinity Testing: pH not less than 5 nor greater than 9.

### 3.4 PREPARATION

- A. Inspect concrete slab floor surfaces to determine that they are satisfactory.
- B. A satisfactory concrete subfloor is defined as one that is smooth, within specified tolerances for flatness, within floor coating or covering manufacturer's maximum acceptable moisture content and within moisture vapor emission limits and free from cracks, holes, ridges, old adhesives, maintenance coatings preventing adhesive bond and other defects impairing performance, appearance or floor covering manufacturer's warranty.
- C. Verify that required floor-mounted utilities are in correct location and installed to proper height to receive flooring material flush with top surface.
- D. General: Prepare concrete floors in accordance with ASTM F710 and the following:
  - 1. Out-of-Tolerance Floor Slabs: Repair areas of slab that do not meet surface tolerances specified under Section 03 30 00. Grind and fill with trowelable underlayment until specified tolerance is achieved. Prepare substrate and install trowelable underlayment in strict conformance with manufacturer's written instructions.
  - 2. Rough or Uneven Floor Slabs: Remove roughness, ridges and bumps. Fill minor low spots, cracks, joints, holes and other defects with trowelable underlayment to achieve smooth, flat, hard surface suitable for floor covering installation.
    - a. Prohibit traffic until underlayment is cured.
  - 3. Contaminated Concrete (oil, grease, wax, asphalt, etc.): Remove all contaminated concrete by mechanical methods, such as shotblasting, grinding, scabbing, jackhammer, etc., and patch affected area with trowelable underlayment or new concrete slab as necessary for specific conditions.
    - a. Do not use solvents or removers.
    - b. Patching concrete slabs exposed to view which are scheduled to receive clear finish coating is not acceptable. Remove these slabs to closest control or construction joints and re-pour concrete.
  - 4. Random Cracks and Single Holes 1-Inch Diameter and Less: Route cracks over 1/16-inch and cut holes to sound concrete. Clean off dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
  - 5. Floor Slab Alkalinity: Where alkalinity test results do not meet requirements of the Contract Documents, corrective action is required.
    - a. Corrective measures include washing and/or priming to bring pH level of concrete slab within acceptable limits.
    - b. Prior to commencing corrective Work, obtain written approval of proposed corrective measure from floor covering manufacturer.

## SECTION 03 35 10 CONCRETE FLOOR SLAB PREPARATION

6. Floor Slab Vapor Emissions: Where vapor emission test results do not meet requirements of the Contract Documents, corrective action is required. Corrective measures include removal of non-compliant concrete by mechanical methods and pouring new concrete or installing vapor emission retarder as specified under Article 3.5 of this Section.
- E. Vacuum clean concrete substrate.

### 3.5 INSTALLATION – VAPOR EMISSION RETARDER

- A. If Contractor determines the need for installing a vapor emission retarder, either to maintain Project Construction Progress Schedule, or as alternative to replacement of a concrete slab that has too high a water vapor emission rate, conform to the following:
  1. Obtain floor coating or floor covering manufacturer's written approval of vapor emission retarder product(s) selected for use.
  2. Select vapor retarder product that will reduce water vapor emission rate of concrete floor slab to level required by floor coating or floor covering manufacturer.
  3. Prepare concrete and install vapor emission retarder in strict conformance with vapor emission retarder manufacturer's installation instructions and as required to achieve specified warranty.
    - a. Include any inspections by manufacturer's technical representative or other special requirements required to achieve specified warranty.

END OF SECTION

## SECTION 03 38 00 POST-TENSIONED CONCRETE

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Post-tensioning of cast-in-place concrete with unbonded, sheathing covered prestressing tendons.
- B. Prestressing tendons, bearing plates, connections, and post-tensioning operations.
- C. Repair of 1,000 lineal feet of cracks in post-tensioned concrete by epoxy injection.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 31 19 – PROJECT MEETINGS: Pre-Installation Conferences.
- C. Section 01 33 00 - SUBMITTALS: Submittal of Shop Drawings, Product Data, Calculations.
- D. Section 01 36 00 - DESIGN-BUILD REQUIREMENTS: Additional requirements.
- E. Section 01 78 39 - PROJECT RECORD DOCUMENTS: Submittal of Record Documents.
- F. Section 03 21 00 - REINFORCING STEEL: Placement of reinforcing steel.
- G. Section 03 30 00 - CAST-IN-PLACE CONCRETE: Placing concrete and finish requirements.
- H. Section 05 50 00 - METAL FABRICATIONS: Items to be embedded.
- I. STRUCTURAL DRAWINGS: General Notes for additional requirements.

#### 1.3 REFERENCES

- A. American Institute of Steel Construction (AISC)
  - 1. AISC 303: Code of Standard Practice for Steel Buildings and Bridges.
- B. American Society of Testing & Materials (ASTM)
  - 1. ASTM A36 / A36M, Standard Specification for Carbon Structural Steel.
  - 2. ASTM A148 / A148M, Standard Specification for Steel Castings, High Strength, For Structural Purposes.
  - 3. ASTM A416 / A416M, Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete.
- C. American Welding Society (AWS)
  - 1. AWS D1.1 / D1.1M: Structural Welding Code - Steel.
- D. Post-Tensioning Institute (PTI)
  - 1. Field Procedures Manual for Unbonded Single Strand Tendons.
  - 1. Specifications for Unbonded Single Strand Tendons.
  - 3. Post-Tensioning Manual.

#### 1.4 SYSTEM DESCRIPTION

- A. Structural Performance: Provide post-tensioning system, with ICC-approved components, to develop final force (design force) indicated on the drawings.
- B. Engineering Responsibility: Engage a manufacturer who utilizes a qualified professional engineer to prepare calculations and other structural data for post-tensioning systems.
- C. Tensioning Criteria
  - 1. Maximum Stress (Jacking Stress): To overcome stressing friction, tendons may be temporarily stressed to a tension higher than initial stress. In no case shall temporary stress exceed 80% strand tensile strength.
  - 2. Stressing Friction: Calculate anticipated stressing friction using, as a basis for calculations, results of field experience and field tests for tendons of similar length. Do not consider this to be actual stressing friction, which must be measured in the field. It is anticipated friction which must be known to properly select the initial stress as specified below.
  - 3. Initial Stress (Anchoring Stress): Not exceeding 70% strand tensile strength, and not exceeding maximum allowable stress (jacking stress) minus anticipated stressing friction, whichever is the least.
  - 4. Final Stress (Design Stress): The stress remaining after all losses and is the stress to be used in calculating the minimum working forces as indicated on the Drawings.

## SECTION 03 38 00 POST-TENSIONED CONCRETE

### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: For requirements see Structural Drawings, General Notes for Post-Tensioned Concrete.
  - 1. Include each detail in shop drawings pertaining to the post-tensioned concrete, specifically noting procedures that may affect working of the structure in part or as a whole.
  - 2. Shop drawings and calculations shall bear the stamp and signature of a professional engineer licensed in the State of Washington.
  - 3. Include ICC Evaluation Reports for components.
- C. Product Data: With the Shop Drawings, submit data covering stressing operations with descriptions of equipment to be used, sequence of operations, evidence that the allowable stress will not be exceeded, method of determining stressing friction, method proposed for determining continuing accuracy of the correlation between gauge reading and actual force exerted by hydraulic jack, all other related data, and complete specifications for materials to be used.
- D. Calculations: For requirements see Structural Drawings, General Notes for Post-Tensioned Concrete.
- E. Mill Certificates: For requirements see Structural Drawings, General Notes for Post-Tensioned Concrete.
- F. Additional Information: With the Shop Drawings, submit:
  - 1. Current gauge calibration chart for each set of stressing equipment.
  - 2. Gauge calibration curve, dated just prior to use of equipment.
  - 3. Test tendon stressing record.
  - 4. Field stressing procedure.
  - 5. Stress-strain curves for each heat, by an independent laboratory.
  - 6. Mill test reports and analyses.
  - 7. Tendon Schedule.
- G. Record Documents: Submit under the provisions of Section 01 78 39. Record actual locations of tendons; stressing sequence and tendon loads established, and tendon elongations. Report percent deviation of measured elongations to calculated elongations.

### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed post-tensioned concrete Work 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, and using systems approved by the local code authority.
  - 1. Supervision: Perform Work of this Section under continuous direction of a superintendent experienced in the required operations, who shall exercise strict control for full compliance with requirements indicated and specified. Maintain complete and current records of the operations.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for post-tensioned concrete installations that are similar to those indicated for this Project in material, design, and extent.
- C. Pre-Installation Conference: Conduct conferences at Project Site to comply with requirements in Section 01 31 19. Review methods and procedures related to post-tensioned concrete including, but not limited to, the following:
  - 1. Review tendons, sleeve locations, and cautions regarding cutting and core drilling.
  - 2. Review and finalize Construction Schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

## SECTION 03 38 00 POST-TENSIONED CONCRETE

### 1.7 PRODUCT DELIVERY, STORAGE, & HANDLING

- A. Deliver strand or prefabricated tendons in coils of adequate diameter to prevent damage or overstressing, each coil securely tied and tagged for identification.
- B. Store under cover and protect from weather.
- C. Handle by methods that prevent scratching of strand wire and all other damage.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Design of metal bearing plates, anchorage devices, stressing grippers, void forms, and slippage sheathing shall be the standard types for the method of post-tensioning used, and shall conform to approved Submittals. Dead-end anchorage shall be factory-applied.
- B. Post-Tensioning Strand: For requirements see Structural Drawings, General Notes for Post-Tensioned Concrete.
- C. Sheathing: For requirements see Structural Drawings, General Notes for Post-Tensioned Concrete.
- D. Distribution Plates and Anchorages: Secure strands at both ends with the approved anchoring devices.
  - 1. Anchoring Devices: Provide devices designed so that strand wire will not kink, neck down, or otherwise be damaged, and to hold strands without slip exceeding 1/8" at load equal to applied load of the wire at tensioning.
  - 2. Distribution Plates: Provide welded or cast steel bearing assemblies to support and distribute load from anchoring devices. Loaded bending stresses shall not exceed 20 ksi for structural steel or 15 ksi for cast steel except as test data may indicate that higher stresses are satisfactory, and corresponding higher stresses may be permitted for higher strength steel; use structural steel conforming to ASTM A36 and cast steel conforming to ASTM A148. Bearing plates, distribution plates, anchor bolts, bearing bars, and the like shall be hot-dip galvanized after fabrication where these items are exposed and unprotected from the weather. Welding shall be inspected and approved before galvanizing.
  - 3. Maximum Concentrated Bearing Stresses: Not exceeding 60 percent of concrete compressive strength at time of tensioning.
  - 4. Design, Fabrication, and Installation: Conform to AISC standards and to AWS D1.1 Structural Welding Code.
  - 5. Recesses: Provide for the concrete or grout covering over strand end connections.
- E. Grout: Non-Shrink Grout: Acceptable manufacturers:
  - 1. BASF.
  - 2. Embeco.
  - 3. Grace.
  - 4. Vibrofoil.
  - 4. Approved Alternate.

### 2.2 SOURCE QUALITY CONTROL

- A. Employ and pay for an independent testing agency to evaluate quality-control and testing methods for post-tensioned concrete.
  - 1. Allow testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with Owner's testing agency and provide samples of materials and concrete mixes as may be requested for additional testing and evaluation.
- B. Testing: Test following samples which shall be furnished by Contractor:
  - 1. One test sample of tendon (uncoated and unwrapped), with complete set of stressing hardware.
  - 2. One test sample of strand for each 5,000 pounds, or fraction thereof, from each heat of strand to be used.
  - 3. Certificate: Transmittal for above test samples shall be accompanied by Contractor's certificate that the submitted test samples are taken from, and are representative of, the materials to be used in the Work.
  - 4. Retained Test Samples: Testing agency shall fasten both broken pieces of each

## SECTION 03 38 00 POST-TENSIONED CONCRETE

test sample together and label with project title, heat and coil number, date tested, and ultimate load, and shall retain test samples available for inspection until disposal is authorized by Architect.

### PART 3 - EXECUTION

#### 3.1 CONCRETE

- A. Conform to Sections 03 21 00, 03 30 00 and the following requirements.
- B. Inserts In Concrete: Accurately install and secure in forms, including enclosures, spacer bars, and other inserts required for Work of this Section; use of powder-driven studs or fasteners is not permitted. Do not attach inserts to tendons.
- C. Edge or End Forms: Accurately drill and prepare for the connection of all anchoring hardware and for projecting strand and reinforcing steel, all securely anchored and braced.
- D. Concrete Placing: Place and compact the concrete by methods that ensure alignment of tendons and reinforcing bars, and to ensure uniform compaction of concrete, especially around end anchorages.
- E. Holes: Holes in concrete, other than those indicated on the Drawings or shown in approved submittals, are not permitted within 2-feet of bearing plates.

#### 3.2 FABRICATING TENDONS

- A. Install strands in the anchorage hardware to form a parallel lay cable with no crossed wires. Apply mastic to completely cover each strand, and cover the mastic with waterproof kraft paper if not enclosed within sheathing. Continue wrapping or covering to tight contact with bearing plates.

#### 3.3 PLACING TENDONS

- A. Bearing Plates: Bolt to forms or securely fasten to reinforcing steel to ensure no displacement occurs during concrete placing, aligned perpendicular to tendon axis. Support tendons at exact vertical locations indicated with steel wire chairs or bolsters of correct height. Provide adequate number of supports, not less than four per span, located to support the tendon in correct parabolic curves.
- B. Supports: In addition to indicated reinforcing bars, provide additional reinforcing bars tied to the tendons to prevent tendon movement during concrete placing. Keep tendons straight in plan and at correct curves. Offset tendons or adjust tendon spacing only when approved in advance.
  - 1. Maximum distance from indicated position: 1/8 inch.
- C. Equipment: In placing tendons, make adequate provision for the stressing equipment by locating the tendons and projecting the reinforcing bars as nearly as possible in a vertical alignment. Keep entire stressing equipment area free of any construction materials and equipment or obstructions until all stressing operations are completed.

#### 3.4 TENSIONING OPERATIONS

- A. Perform tensioning under continuous inspection of an Inspector. Do not start operations until tests on field-cured concrete test cylinders specified in Section 03 30 00 indicate concrete has attained the strength indicated on the Drawings or a minimum 3,000 psi compressive strength.
- B. Jacks: Stress tendons with approved motor-operated hydraulic jacks that provide uniform pressure, each jack equipped with an accurately calibrated gauge at least six inches in diameter, having a fine pointer, and with gauge pressure markings at close increments to permit computing of stress at any time. Maintain jacking, tensioning, and tendon elongation records as work progresses. Jack against tendon pressure plates, not against concrete.
- C. Stressing Friction: Determined in the field by Contractor and Inspector, using the approved method.
- D. Tensioning: Perform by jacking. For tendons 100 feet long or less, jack from one end unless otherwise shown or approved in advance. For tendons greater than 100 feet long,



## SECTION 03 38 00 POST-TENSIONED CONCRETE

jack from each end unless otherwise shown or approved in advance.

- E. Procedure: Based on the stressing friction determined as specified under Paragraph 3.5 C "Stressing Friction" of this Section, stressing procedure shall be established, approved, and followed by the stressing personnel. In general, the procedure for each tendon shall conform to the following:
1. Stressing: Stress to a gauge reading equivalent to initial stress plus maximum stress required to overcome stressing friction, as determined above.
  2. Grippers: Insert grippers and gradually reduce jack load to transfer stressing stress to anchorages.
  3. Restressing: Restress tendon and record the gauge reading at which all load is completely removed from grippers. This load shall be not less than the gauge reading equal to the initial stress (anchoring stress) on the tendon. A variation of 7 percent plus or minus is acceptable for any one tendon provided that the initial stress in any three adjacent tendons is no less than the sum of required stress for these three tendons. Any cumulative negative tolerance resulting in overall reduction of initial stress will not be permitted.
  4. Cut off excess tendon inside face of concrete only after elongation records have been reported and approved. Apply touch-up primer to cut end or add caps for fully encapsulated tendons.
- F. Stressing Sequence: Conform to the approved Submittals.

### 3.5 GROUTING

- A. Promptly when the tensioning operations are completed on a tendon, coat end anchorages, grippers, and tendon ends with an approved epoxy concrete adhesive. Fill pockets of stressing terminals while the epoxy adhesive is fresh with a non-shrink grout, installed as a stiff mixture, rammed solid, troweled smooth where exposed, and damp cured until fully set.

### 3.6 REPAIR OF SURFACE DEFECTS

- A. Repair surface defects in accordance with Section 03 30 00.
- B. Modify or repair concrete not conforming to required lines, details, and elevations.
- C. Modify or repair concrete not properly placed, resulting in honeycombing or other defects.
- D. Provide 1000 lineal feet of crack repair as directed by the Architect during the first year after Substantial Completion. Crack injection shall include pressure injection of epoxy filler.

### 3.7 FIELD QUALITY CONTROL

- A. Inspection: Continuous inspection is required during placing of tendons and other reinforcing, anchorages, concrete, and during stressing operations.
- B. Survey: Contractor's Surveyor shall instrument survey post-tensioned concrete both before and after post-tensioning operations are performed, and again 30 days after completion of stressing, as directed. Survey shall include mid-span elevations. Submit copies of complete survey results.

END OF SECTION



## SECTION 03 45 00 ARCHITECTURAL PRECAST CONCRETE

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide architectural precast concrete to receive elastomeric coating in accordance with the Contract Documents.
- B. Precast concrete exterior wall panels as indicated at existing K-Wing.
- C. Precast concrete stair treads at steel stairs.
  - 1. Installation of precast concrete stair treads is to be delayed until near Date of Substantial Completion as indicated below in this Section.
- D. Bidder-design, fabrication and erection.
- E. Bidder-designed non-load bearing precast concrete panel system matching panel sizes and profiles shown on Drawings.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 36 00 - DELEGATED DESIGN REQUIREMENTS: for requirements of Bidder-designed Work.
- D. Section 03 21 00 REINFORCING STEEL: for placement of reinforcing steel.
- E. Section 03 30 00 CAST-IN-PLACE CONCRETE: for mix design and finish requirements.
- E. Section 05 50 00 METAL FABRICATIONS: for items to be embedded.
- F. Section 05 51 00 - METAL STAIRS & RAILINGS: for steel stair pans to receive precast concrete stair treads.
- G. Section 07 62 00 - SHEET METAL FLASHINGS & TRIM: for reglets cast-in and sawcut into precast concrete panels.
- H. Section 07 92 00 - JOINT SEALANTS.
- I. Section 09 91 00 - PAINTING: for elastomeric coating.
- J. STRUCTURAL DRAWINGS: for General Notes - Additional requirements.

#### 1.3 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 301, Specifications for Structural Concrete.
  - 2. ACI 318, Building Code Requirements for Structural Concrete and Commentary.
- B. ASTM International (ASTM):
  - 1. ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. ASTM A283, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
  - 3. ASTM A416, Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete.
  - 4. ASTM A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
  - 5. ASTM C33, Standard Specification for Concrete Aggregates.
  - 6. ASTM C150, Standard Specification for Portland Cement.
  - 7. ASTM C260, Standard Specification for Air Entraining Admixtures for Concrete.
  - 8. ASTM C1107/C1107M, Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
  - 9. ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.
- C. American Welding Society (AWS):
  - 1. AWS D1.1 / D1.1M: Structural Welding Code - Steel.
  - 2. AWS D1.4 / D1.4M: Structural Welding Code - Reinforcing Steel.
- D. Concrete Reinforcing Steel Institute (CRSI):
  - 1. Manual of Standard Practice, 27th Edition.
- E. International Code Council (ICC):
  - 1. International Building Code (IBC) as amended by State of Washington.

## SECTION 03 45 00 ARCHITECTURAL PRECAST CONCRETE

- F. Precast Concrete Institute (PCI):
  - 1. PCI MNL-117, Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.

### 1.4 DESIGN CRITERIA

- A. Design, fabricate and install units to ensure they will:
  - 1. Withstand wind loads of panels and supporting window wall per basic wind speed as indicated on Structural Drawings.
  - 2. Meet design load requirements and joint design for seismic Zone 3, occupancy category as indicated on Structural Drawings.
  - 3. Withstand load incurred by handling, storage, transportation and erection without forming tension cracks.
  - 4. Satisfy applicable requirements of IBC Chapters 16, 17 and 19.
  - 5. Precast sections are intended to be reinforced with mild steel. Prestressing is a Bidder option, provided appearance is not compromised.

### 1.5 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following Codes, Specifications and Standards, except as otherwise indicated:
  - 1. International Building Code.
  - 2. ACI 301.
  - 3. ACI 318.
  - 4. CRSI Manual of Standard Practice.
  - 5. PCI MNL-117.
- B. Fabricator's Qualifications: Firm shall have a minimum of 5 years experience in producing units similar to those required for this Project, with sufficient production capacity to produce and deliver required units without causing delay in Work.
  - 1. Fabricator shall be certified by one of the following:
    - a. Architectural Precast Association (APA).
    - b. Precast / Prestressed Concrete Institute (PCI), Group A1.
    - c. Applicable authority having jurisdiction.
  - 2. In addition to the qualifications listed above the fabricator shall be approved by the authority having jurisdiction to perform Work without special inspection and shall submit a certificate of compliance to the Architect and Building Official at the completion of the work.
  - 3. Welder's qualification: Provide certification that welders to be employed in the Work are certified by AWS and applicable local Building Officials, and have been re-certified in the last 12 months.
- C. Design Qualifications: The design of the precast concrete units and their anchorage shall be performed by a structural engineer, experienced in the design of precast concrete and who is licensed in the jurisdiction where Project is located. Shop Drawings and calculations shall bear his stamp.
- D. Plant Inspection: Provide access for Architect, his consultants and Contracting Officer to visit production facility and inspect formwork and quality control procedures.

### 1.6 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's Specifications and instructions for each type of manufactured materials and products.
- C. Manufacturer's certifications.
- D. Laboratory Test Reports as required.

## SECTION 03 45 00 ARCHITECTURAL PRECAST CONCRETE

- E. Shop Drawings: Submit Drawings stamped by the structural design engineer, showing complete information for fabrication and installation of architectural precast concrete units.
  - 1. Indicate member dimensions and cross-section; location, size and type of reinforcement, including special reinforcement and lifting devices necessary for handling and erection.
  - 2. Indicate layout, dimensions, and identification of each precast unit corresponding to the sequence and procedure of installation. Indicate welded connections by AWS standard symbols. Detail inserts, connections, embedded items and joints, including accessories and construction at openings in precast units. Show methods of horizontal and vertical adjustment of precast panel connections.
  - 3. Indicate location and details of anchorage devices that are to be embedded in other construction with tolerances for their positioning, and anticipated clearances to precast units.
  - 4. Architect's review is for general conformance to requirements of the Contract Documents.
  - 5. Design of formwork for structural stability is Contractor's responsibility.
- F. Calculations: Submit 2 sets of stamped structural calculations for architectural precast concrete furnished under this Section.
- G. Design mixes: For each concrete mix, include alternate mix designs when characteristics of materials, Project conditions, weather, test results or other circumstances warrant adjustments.

### 1.7 MOCK-UPS

- A. Prepare full size mock-up of each type of finish architectural precast concrete unit for Architect's inspection at production plant or on Site prior to start of installation work and after Architect's review of finish samples.
- B. Acceptable full-size mock-ups may be incorporated in finished Work.
- C. Approved mock-ups shall establish quality standard for this Project.

### 1.8 DELIVERY, STORAGE & HANDLING

- A. Deliver precast concrete units to Project Site in such quantities and at such times to assure continuity of installation. Store units at Project Site to prevent cracking, distortion, staining or other physical damage and so that markings are visible. Lift and support units at designated lift points.
- B. Deliver anchorage items which are to be embedded in other construction before start of such Work. Provide setting diagrams, templates, instructions and directions as required for installation.

## PART 2 - PRODUCTS

### 2.1 FORM WORK

- A. Provide forms of metal, plastic, wood or other material that is non-reactive with concrete and will produce smooth, flat finish surfaces.
  - 1. Forms for textured finish concrete: Units of face design, size, arrangement and configuration to match Architect's control sample. Provide solid backing and form supports to ensure stability of textured form liners.
- B. Accurately construct forms mortar-tight. Maintain formwork as required to provide completed precast concrete units of the shapes, lines and dimensions indicated.

### 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A615, Grade 60, unless otherwise indicated.

## SECTION 03 45 00 ARCHITECTURAL PRECAST CONCRETE

- B. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing.
    - 1. For exposed-to-view exterior concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI Class 1) or stainless steel protected (CRSI Class 2).
  - C. Prestressing Tendons: Uncoated, 7-wire stress-relieved strand complying with ASTM A416.
- 2.3 CONCRETE MATERIALS
- A. Portland Cement: ASTM C150, Type I or Type II. Use only one brand and type of cement throughout the Project unless otherwise acceptable to Architect.
  - B. Aggregates: ASTM C33.
  - C. Water: Drinkable.
  - D. Water-Reducing Admixture: ASTM C494, Type A.
  - E. Air Entraining Admixture: ASTM C260.
- 2.4 CONNECTION & EMBEDDED MATERIALS
- A. Steel Plates: Structural quality, hot-rolled carbon steel, ASTM A283, Grade C.
  - B. Connections: Provide steel embedded plates, clip angles, seat angles, anchors, dowels, threaded rods, bolts, hangers and other miscellaneous steel shapes and hardware as indicated and as necessary for securing precast units to other supporting and adjacent members. Include items embedded in cast-in-place concrete, and loose items.
  - C. Finish of Steel Units: Exposed exterior units hot-dip galvanized after fabrication, ASTM A153; inserts cast into precast units hot-dip galvanized, electro-galvanized or cadmium coated, others shop-painted with rust-inhibitive primer. Embedded items in building slabs shall have no finish on embedding surfaces.
  - D. Reglets: Cast-in and sawcut as specified under Section 07 62 00.
- 2.5 GROUT MATERIALS
- A. Non-Metallic, Non-Shrink Grout: Premixed, non-metallic, non-corrosive, non-staining grout containing selected silica sands, Portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C1107/C1107M of consistency suitable for application.
- 2.6 PROPORTIONING & DESIGN OF MIXES
- A. Prepare design mixes for each type of concrete required.
  - B. Design mixes may be prepared by an independent testing facility or by qualified precast manufacturing plant personnel, at precast manufacturers option.
  - C. Proportion mixes by either laboratory trial batch or field experience methods, using materials to be employed on the project for each type of concrete required, complying with ACI 318.
    - 1. Compressive strength: 4,000 psi minimum, as required by structural design.
    - 2. Submit written reports to Architect of proposed mix for each type of concrete at least 15 days prior to start of precast unit production.
    - 3. Do not begin concrete production until mixes and evaluations have been reviewed by Architect.
    - 4. Adjustment to concrete mixes: Mix design adjustments may be requested when characteristics of materials, job conditions, weather, test results or other circumstances warrant.
    - 5. Laboratory test data for revised mix designs and strength results must be submitted to and accepted by Architect before using in the Work.
  - D. Admixtures:
    - 1. Use water-reducing admixtures in strict compliance with manufacturer's directions.
    - 2. Admixtures to increase cement dispersion, or provide increased workability for low-slump concrete, may be used subject to Architect's acceptance.

## SECTION 03 45 00 ARCHITECTURAL PRECAST CONCRETE

3. Use amounts as recommended by admixture manufacturer for climatic conditions prevailing at time of placing. Adjust quantities of admixtures as required to maintain quality control.

### 2.7 FABRICATION

- A. General: Fabricate precast concrete units complying with manufacturing and testing procedures, quality control recommendations and dimensional tolerances of PCI MNL-117, and as specified for types of units required.
- B. Built-In Anchorages: Accurately position built-in anchorage devices and secure to form work.
  1. Locate anchorages where they do not affect position of main reinforcement or placing of concrete.
  2. Do not relocate bearing plates in units unless acceptable to Architect.
- C. Precast Panels:
  1. Coat surfaces of forms with bond-breaking compound before reinforcement is placed. Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces requiring bond or adhesion. Apply in compliance with manufacturer's instructions.
  2. Provide reinforcement free of loose rust and mill scale and other materials which reduce or destroy bond with concrete.
  3. Accurately position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
  4. Place reinforcement to obtain at least the minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
  5. Identification: Provide permanent markings in precast units to identify pick-up points and orientation in the structure, complying with markings indicated on final Shop Drawings. Imprint date of casting on each precast unit on a surface which will not show in finished structure.
  6. Lifting hardware: Recess hardware from surfaces exposed at completion. Locate in uniform pattern as accepted on Shop Drawings.
  7. Fabrication tolerances on members exposed on elevations shall comply with PCI MNL-117 or as specified herein, whichever is more stringent.
    - a. Length: plus or minus 1/8 inch per 10 feet, plus or minus 1/4 inch maximum.
    - b. Cross sectional dimensions:
      1. Less than 24 inches: Plus or minus 1/4 inch
      2. 24 inches to 36 inches: Plus or minus 3/8 inch
      3. Over 36 inches: plus or minus 1/2 inch
    - c. Thickness: Plus or minus 1/4 inch.
    - d. Position of anchors and inserts: Plus or minus 1/2 inch of center line locations shown on drawings.
    - e. Horizontal alignment (sweep): 1/4 inch, or 1/8 inch per 10 foot length, whichever is greater, maximum of 1/2 inch gap between two (2) adjacent members due to sweep.
    - f. End squareness: 3/16 inch maximum.
    - g. Out of square: 1/8 inch per 6 foot diagonal measurement, or 1/4 inch total.
    - h. Warpage after installation: 1/8 inch per 6 foot length, or 3/8 inch, whichever is greater.
- D. Place concrete in a continuous operation to prevent formation of seams or planes of weakness in precast units, complying with requirements of ACI 304.
  1. Thoroughly consolidate placed concrete by internal and external vibration without dislocation or damage to reinforcement and built-in items.

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- E. Curing by low-pressure steam, by steam vapor, by radiant heat and moisture, or other similar process may be employed to accelerate concrete hardening and to reduce curing time.
- F. Finish of Formed Surfaces: Provide finishes for formed surfaces of precast concrete as indicated for each type of unit, and as follows:
  - 1. Standard finish (edges and non-exposed surfaces): Normal plant run finish produced in forms that impart a smooth finish to concrete.
  - 2. Small surface holes caused by air bubbles, normal form joint marks and minor chips and spills will be tolerated, but no major or unsightly imperfections, honeycomb, or structural defects will be permitted.
  - 3. Smooth-face form finish: Lightly sandblasted smooth surface finish for exposed faces, provided by continuous metal form, metal table, fiberglass or resin coated plywood.
  - 4. Faces, when painted, shall be flush and smooth with no evidence of form welding, oil canning, dimples, nail holes or projections.
  - 5. Float or trowel finish: Smooth surface finish for unformed surfaces, that will not be exposed on the exterior of the building.
  - 6. Textured surface finish imparted by form liners or inserts to provide surfaces free of pockets, streaks and honeycomb, with uniform color and texture to match Architect's control sample.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. General: Deliver anchorage items which are to be embedded in other construction before start of such Work. Provide setting diagrams, templates, instructions and directions as required for installation.
- B. Do not install precast units until concrete has attained its design compressive strength.
- C. Install precast concrete members plumb, level and in alignment within and specified limits of erection tolerances.
- D. Provide temporary supports and bracing as required to maintain position, stability and alignment as members are being permanently connected.
  - 1. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
- E. Accessories: Install clips, hangers and other accessories required for erection of precast units to supporting members and back-up materials.
- F. Precast Concrete Stair Treads: Not earlier than 8 weeks before the date of Substantial Completion, remove temporary plywood stair treads from steel stair pans and install precast concrete stair tread units. Attach firmly in place to steel pans.
- G. Anchor units in final position by bolting, welding, grouting or as otherwise indicated. Remove temporary shims, wedges and spacers as soon as possible after anchoring is completed.
  - 1. At bolted connections use lock washers or other acceptable means to prevent loosening of nuts.
  - 2. Welding: Perform all welding in compliance with AWS D1.1 and AWS D1.4.
  - 3. At welded connections apply rust-inhibitive coating on damaged areas, same as shop-applied material. Use galvanized repair coating on galvanized surfaces.
- H. Cleaning: Clean exposed facings to remove dirt and stains which may be on units after erection and completion of joint treatments.
  - 1. Wash and rinse in accordance with precast manufacturer's recommendations.
  - 2. Protect other Work from damage due to cleaning operations.
  - 3. Do not use cleaning materials or processes which could change the character of exposed concrete finishes.

#### 3.2 ERECTION TOLERANCES

- A. Warpage: Fabricate and install wall panels so that each panel after erection complies with the following dimensional requirements:



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1. Bowing (concave or convex) of any part of a flat surface not to exceed length of bow / 360, with a maximum of 1/2 inch up to 25 foot length.
2. Maximum warpage of one corner out-of-plane of other three, the greater of 1/16 inch per one foot distance from the nearest adjacent corner, or 1/8 inch.
- B. Tolerances for Location of Precast Units: Erect precast units so that joints between panels meet the following:
  1. Face width of joints: Plus or minus 3/16 inch.
  2. Joint taper: 1/40 inch per foot length, with maximum length of tapering in one direction of 10 feet.
  3. Step in face: 1/4 inch.
  4. Jog in alignment of adjacent panels: 3/16 inch.
  5. Alignment for exterior panels is outside face.
  6. Variation from plumb: Plus or minus 1/2 inch in any 40 foot run.
  7. Variation from level: Plus or minus 1/2 inch in any 40 foot run.

### 3.3 PERFORMANCE REQUIREMENTS

- A. Conduct inspections, perform testing and make repairs or replace unsatisfactory precast units as required.
  1. The Owner may contract for on-site inspection services by an independent testing laboratory. Repair or replace all connections, welds or attachments that do not comply with reviewed Shop and Erection Drawings.
- B. In addition to above, in-place precast units may be rejected for any one of the following:
  1. Exceeding specified installation tolerances.
  2. Damaged during construction operations.
  3. Exposed-to-view surfaces which have surface finish deficiencies.
  4. Other defects as listed in PCI MNL-117.

### 3.4 PATCHING

- A. Typical for all Precast Units:
  1. In presence of Architect, repair an exposed face surface and demonstrate materials and methods proposed for repair of surface blemishes.
  2. Patching of damaged exposed face surfaces may be permitted when acceptable to Architect and provided the structural adequacy is not impaired. Otherwise, remove and replace damaged units when patching repairs are unacceptable to Architect.
  3. Field patching materials shall be furnished by precast concrete fabricator. Use of patching materials from other sources not permitted.
- B. Special Requirements for Units Exposed on Elevations:
  1. Match texture and color of surrounding concrete.
  2. Apply bonding agent prior to patching.
  3. Minimize shrinkage.
  4. Replace defective Work if patching is ruled unacceptable.

END OF SECTION



## SECTION 03 45 02 PATCHING EXISTING ARCHITECTURAL PRECAST CONCRETE

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Patch existing architectural precast concrete in accordance with the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: for test sample.

### PART 2 - PRODUCTS - NOT USED

### PART 3 - EXECUTION

#### 3.1 PATCHING

- A. Typical for all Precast Units:
  - 1. In presence of Architect, repair an exposed face surface and demonstrate materials and methods proposed for repair of surface blemishes.
  - 2. Field patching materials shall be acceptable to precast concrete fabricator.
- B. Special Requirements for Units Exposed on Elevations:
  - 1. Match texture and color of surrounding concrete.
  - 2. Apply bonding agent prior to patching.
  - 3. Minimize shrinkage.
  - 4. Replace defective Work if patching is ruled unacceptable.

END OF SECTION



## SECTION 04 05 13 MASONRY MORTARING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Quality of masonry mortar used on Project.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 12 – COORDINATED SUBMITTAL REQUIREMENTS: Submittals of this Section are affected by coordinated simultaneous submittal requirements.
- C. Section 04 21 13 - BRICK MASONRY: Furnish and install mortar.
- D. Section 04 22 00 - CONCRETE UNIT MASONRY: Furnish and install mortar.
- E. STRUCTURAL DRAWINGS: General Notes for additional requirements.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C144, Standard Specification for Aggregates for Masonry Mortar.
  - 2. ASTM C150, Standard Specification for Portland Cement.
  - 3. ASTM C207, Standard Specification for Hydrated Lime for Masonry Purposes

#### 1.4 SYSTEM DESCRIPTION

- A. Use of pre-mixed mortar is not allowed.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Portland Cement: Meet requirements of ASTM C150, Type I, low-alkali type.
- B. Hydrated Lime: Meet requirements of ASTM C207, Type S.
  - 1. No additives are allowed for air entrainment.
- C. Aggregate: Natural or manufactured sand meeting requirements of ASTM C144.
- D. Mortar Color Pigments: High purity, chemically inert, unfading, alkali-fast mineral oxides, finely ground and especially prepared for mortar. Color as selected by Architect.
  - 1. Acceptable Manufacturers:
    - a. Davis Colors, [www.daviscolors.com](http://www.daviscolors.com).
    - b. Solomon Colors, Inc. [www.solomoncolors.com](http://www.solomoncolors.com).
- E. Water: Drinkable.
- F. Admixtures: Use no admixtures except for color pigments specified for mortar.
  - 1. Use of admixtures to meet cold weather requirements is expressly forbidden.

#### 2.2 MIXES

- A. Where not otherwise indicated, meet the following:

Description	Type N Mortar	Type S Mortar
Min. 28-Day Compressive Strength	750 psi	1900 psi
Portland Cement Ratio	1	1
Hydrated Lime Ratio	1/2 min. to 1-1/4 max.	1/4 min. to 1/2 max.
Damp Loose Sand Ratio	2-1/4 min. and 3 max., times sum of volumes of cement and lime used	2-1/4 min. and 3 max., times sum of volumes of cement and lime used

END OF SECTION



## SECTION 04 05 19 MASONRY ANCHORAGE & REINFORCING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Products furnished but not installed under this Section, includes:
  - 1. Masonry reinforcing steel as described in the Contract Documents.
  - 2. Seismic veneer anchors for masonry backed by framed walls.
  - 3. Horizontal joint reinforcing as described in the Contract Documents.
  - 4. Adjustable concealed lintel system.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 04 21 13 - BRICK MASONRY: Installation.
- C. Section 04 22 00 - CONCRETE UNIT MASONRY: Installation.
- D. Section 05 50 00 - METAL FABRICATIONS: Relief angles.
- E. STRUCTURAL DRAWINGS: General Notes for additional requirements.

#### 1.3 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. ASTM A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

### PART 2 - PRODUCTS

#### 2.1 REINFORCING STEEL

- A. As indicated on Structural Drawings.

#### 2.2 SEISMIC VENEER ANCHORS

- A. As indicated on Structural Drawings (masonry anchor ties).

#### 2.3 ADJUSTABLE CONCEALED LINTEL SYSTEM

- A. Basis of Design: Flat arch, stainless steel by Halfen Anchoring Systems, [www.halfenusa.com](http://www.halfenusa.com).

END OF SECTION





## SECTION 04 21 13 BRICK MASONRY

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install veneer brick and mortar as described in the Contract Documents.
- B. Exterior walls designed as rainscreen system.
- C. Cleaning of all brick masonry shall be responsibility of the brick mason.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 07 19 00 - WATER REPELLANTS.
- C. Section 07 62 00 - SHEET METAL FLASHING & TRIM: for flashing.
- D. Section 09 06 09 - EXTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.
- D. STRUCTURAL DRAWINGS: General Notes for additional requirements.

#### 1.3 MATERIAL INSTALLED BUT FURNISHED BY OTHERS

- A. Bolts.
- B. Anchors.
- C. Nailing blocks.
- D. Inserts.
- E. Flashing.
- F. Lintels.
- G. Doors.
- H. Window frames.
- I. Vents.
- J. Conduits.
- K. Expansion joints.

#### 1.4 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C67, Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
  - 1. ASTM C216, Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale).

#### 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Except as otherwise specified, provide all brick masonry units produced by same manufacturer.
- B. Brick Tests (To be used only in case of dispute):
  - 1. Test in accordance with ASTM C67 with the following additional requirements:
    - a. If Coefficient of Variation of compression samples tested exceeds 12 percent, obtain compressive strength by multiplying average compressive strength of specimens by where  $v$  is the coefficient of variation of sample tested.
    - b. Cost of tests of units after delivery shall be borne by installer, unless tests indicate that units do not meet requirements of the Contract Documents, in which case cost shall be borne by manufacturer.

#### 1.6 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Samples: For selection purposes, lay up two dry stacks for each color of full-size brick units as samples, showing extreme variations in color and texture.
  - 1. Each dry stack shall be not less than 48 by 48 inches in size and south facing exposure.
  - 2. Dry stacks may be at manufacturer's facility. Notify Architect not less than 5 working days before to schedule travel to manufacturer's facility.
  - 3. Architect will select and mark brick units in each dry stack to establish acceptable color and texture range for finished Work.
  - 4. Brick units marked by Architect as acceptable in dry stacks:

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- a. From first dry stack, ship to Project Site and incorporate into brick masonry mock-up in accessible and visible location.
    - b. From second dry stack, maintain at manufacturer's facility to be used as reference for selecting acceptable brick units for this Project.
  - 5.
  - C. Certificates: Prior to delivery, submit to Architect certificates attesting compliance with applicable Specifications for grades, types or classes included in the Contract Documents.
- 1.7 MOCK-UP
- A. Prior to starting Work of this Section construct field mock-up, as indicated on Drawings, where directed by Contracting Officer, for Architect and Owner review.
  - B. Mock-up will not be part of final Work.
  - C. Mock-up shall incorporate submitted materials approved for use on this Project.
  - D. Approved mock-up shall establish quality standard for the Project and remain for reference until completion of masonry Work.
  - E. After completion of masonry Work, demolish and remove mock-up from Project Site.
- 1.8 DELIVERY, STORAGE & HANDLING
- A. Store brick off ground to prevent contamination by mud, dust or materials likely to cause staining or other defects.
  - B. Cover materials when necessary to protect from elements.
  - C. Protect reinforcement from elements.
- 1.9 PROJECT / SITE CONDITIONS
- A. Wall Covering: During erection, cover top of wall with strong waterproof membrane at end of each day or shutdown.
    - 1. Cover partially completed walls when work is not in progress.
    - 2. Extend cover minimum of 24 inches (610 mm) down both sides.
    - 3. Hold cover securely in place.
  - B. Staining: Prevent grout or mortar from staining the face of masonry to be left exposed or painted:
    - 1. Remove immediately grout or mortar in contact with face of such masonry.
    - 2. Protect all sills, ledges and projections from droppings of mortar, protect door jambs and corners from damage during construction.
  - C. Protection: If ice or snow has formed on masonry bed, remove by carefully applying heat until top surface is dry to the touch.
    - 1. Remove all masonry deemed frozen or damaged.
  - D. Products: When brick suction exceeds recommendations of Section 1.03.B.3, sprinkle with heated water:
    - 1. When units are above 32 deg F (0 deg C), heat water above 70 deg F (21 deg C).
    - 2. When units are below 32 deg F (0 deg C), heat water above 130 deg F (54 deg C).
    - 3. Use dry masonry units.
    - 4. Do not use wet or frozen units.
  - E. Construction Requirements While Work is Progressing:
    - 1. Air temperature 40 deg F (4 deg C) to 32 deg F (0 deg C):
      - a. Heat sand or mixing water to produce mortar temperatures between 40 deg F (4 deg C) and 120 deg F (49 deg C).
    - 2. Air temperature 32 deg F (0 deg C) to 25 deg F (-4 deg C):
      - a. Heat sand and mixing water to produce mortar temperatures between 40 deg F (4 deg C) and 120 deg F (49 deg C).
      - b. Maintain temperatures of mortar on boards above freezing.
    - 3. Air temperatures 25 deg F (-4 deg C) to 20 deg F (-7 deg C):
      - a. Heat sand and mixing water to produce mortar temperatures between 40 deg F (4 deg C) and 120 deg F (49 deg C).
      - b. Maintain mortar temperatures on boards above freezing.
      - c. Use salamanders or other heat sources on both sides of walls under construction.

## SECTION 04 21 13 BRICK MASONRY

- d. Use windbreaks when wind is in excess of 15 mph.
- 4. Air temperature 20 deg F (-7 deg C) and below:
  - a. Heat sand and mixing water to produce mortar temperatures between 40 deg F (4 deg C) and 120 deg F (49 deg C).
  - b. Provide enclosures and auxiliary heat to maintain air temperature above 32 deg F (0 deg C).
  - c. Minimum temperature of units when laid: 20 deg F (-7 deg C).
- F. Protection Requirements for Completed Masonry and Masonry Not Being Worked On:
  - 1. Mean daily air temperature 40 deg F (4 deg C) to 32 deg F. (0 deg C): Protect masonry from rain or snow for 24 hr. by covering with weather-resistive membrane.
  - 2. Mean daily air temperature 32 deg F (0 deg C) to 25 deg F (-4 deg C): Completely cover masonry with weather-resistive membrane for 24 hours.
  - 3. Mean daily air temperature 25 deg F (-4 deg C) to 20 deg F (-7 deg C): Completely cover masonry with insulating blankets or equal protection for 24 hours.
  - 4. Mean daily air temperature 20 deg F (-7 deg C) and below:
    - a. Maintain masonry temperature above 32 deg F (0 deg C) for 24 hours by enclosure and supplementary heat, electric heating blankets, or other approved methods.

### PART 2 - PRODUCTS

#### 2.1 BRICK

- A. Type FBS, Grade SW.
- A. Approved Manufacturers:
  - 1. Basis of Design: Interstate Brick, [www.interstatebrick.paccoast.com](http://www.interstatebrick.paccoast.com).
  - 2. Mutual Materials, [www.mutualmaterials.com](http://www.mutualmaterials.com).
- B. Field Brick:
  - 1. Size: 2-1/4 inch Emperor, face dimension of 15-1/2 W x 2-1/4 H x 3-1/2 inches depth.
  - 2. Color: As scheduled in Section 09 06 09.
- C. Accent Brick:
  - 1. Size:
    - a. 2-1/4 inch Emperor, face dimension of 15-1/2 W x 2-1/4 H x 3-1/2 inches depth, used as soldiers and accent color.
    - b. 7-9/16 Modular, face dimension of 7-9/16 W x 7-9/16 H x 3-1/2 inches depth, used as accent courses.
  - 2. Color: As scheduled in Section 09 06 09.
- D. Special shapes:
  - 1. Lipped soldier.
  - 2. Emperor corner.
  - 2. As indicated or required. Use solid brick units where coursing would otherwise show cores.

#### 2.2 ACCESSORIES

- A. Mortar: As specified under Section 04 05 13. Color as selected by Architect.
- B. Masonry Anchorage and Reinforcing: As specified under Section 04 05 19.
- C. Mortar Deflector: Mortar Net by Mortar Net USA Ltd, [www.mortarnet.com](http://www.mortarnet.com).
- D. Weep Vents: Weep Vent by Mortar Net USA Ltd, [www.mortarnet.com](http://www.mortarnet.com).
- E. Ventilation Vents: Weep Vent by Mortar Net USA Ltd, [www.mortarnet.com](http://www.mortarnet.com).

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Wetting Brick: Wet brick with absorption rates in excess of 30 grams/30 sq. in./min. (30 grams/194 cm<sup>2</sup>/min.) determined by ASTM C67, so that rate of absorption when laid does not exceed this amount.
  - 1. Recommended procedure to insure that brick are nearly saturated, surface dry

## SECTION 04 21 13 BRICK MASONRY

when laid is to place a hose on the pile of brick until water runs from pile. This should be done one day before brick are to be used. In extremely warm weather, place hose on pile several hours before brick are to be used.

- B. Cleaning Reinforcement: Before being placed, remove loose rust, ice and other coatings from reinforcement.

## 3.2 GENERAL ERECTION REQUIREMENTS

- A. Bond Pattern: Lay exposed masonry in running bond unless otherwise indicated. Bond unexposed masonry units in a wythe by lapping not less than 2 inches (51 mm).
- B. Joining of Work:
  - 1. Where fresh masonry joins partially set masonry, remove loose brick and mortar. Clean and lightly wet exposed surface of set masonry.
  - 2. Stop off horizontal run of masonry by racking back 1/2 length of unit in each course.
  - 3. Toothing is not permitted except upon written approval of Architect.
- C. Tooling and Tuck Pointing:
  - 1. Tooling: Tool exposed joints when "thumb-print" hard with a round jointer, slightly larger than width of joint. Trowel-point or concave-tool exterior joints below grade.
    - a. Flush cut all joints not tooled.
  - 2. Tuck pointing:
    - a. Rake mortar joints to a depth of not less than 1/2 inch (12.7 mm) nor more than 3/4 inch (19 mm).
    - b. Saturate joints with clean water.
    - c. Fill solidly with pointing mortar to match that of mortar used in wall construction.
    - d. Tool joints.
- D. Flashing: Clean surface of masonry smooth and free from projections which might puncture flashing material.
  - 1. Place through-wall flashing on bed of mortar.
  - 2. Cover flashing with mortar.
- E. Weep Holes: Provide weep holes in head joints in first course immediately above all flashing by leaving head joint free and clean of mortar. Maximum spacing: 24-inch (610 mm) centers.
  - 1. Keep weep holes and area above flashing free of mortar droppings.
- F. Sealant Recesses: Leave joints around outside perimeters of exterior doors, window frames and other wall openings: Depth: uniform 3/4 in. (19 mm). Width: 1/4 in. (6.4 mm) to 3/8 in. (9.5 mm).
- G. Movement Joints: Cutting Brick: Keep clean from all mortar and debris. Locate as shown on Drawings.
- H. Cutting Brick: Cut exposed brick with motor-driven saw which provide cuts that are straight and true.
- I. Mortar Joint Thickness: Lay all brick with [insert] inch joint.

END OF SECTION



## SECTION 04 22 00 CONCRETE UNIT MASONRY

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install concrete unit masonry as described in the Contract Documents.

#### 1.2 RELATED SECTIONS

- 1. Section 07 92 00 - JOINT SEALANTS: for sealing of joints.
- 2. Section 09 06 10 - EXTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.
- 3. Section 09 91 00 - PAINTING: for paint finishes of concrete unit masonry.

#### 1.3 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 530.1, Building Code Requirements for Masonry Structures & Specifications for Masonry Structures & Commentaries
- B. American Society of Civil Engineers (ASCE):
  - 1. ASCE 6,
- C. American Society for Testing and Materials (ASTM):
  - 1. ASTM C90, Standard Specification for Loadbearing Concrete Masonry Units.
  - 2. ASTM C270, Standard Specification for Mortar for Unit Masonry.
- D. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.

#### 1.4 QUALITY ASSURANCE

- A. Standards: Perform work in accordance with the following Standards unless more stringent Standards are specified herein:  
IBC, 2003 Edition, Chapters 14 and 21.  
American Concrete Institute / ACI International; American Society of Civil Engineers; and The Masonry Society.  
ACI 530.1 / ASCE 6 / TMS 602-02: Specification for Masonry Structures
- B. Special Inspection: The Owner will engage an independent Testing Agency to inspect the placement of reinforcing steel and grout, take and test grout samples for concrete masonry Work only.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Manufacturer's Data: Submit manufacturer's specifications, with copies of laboratory test reports and other data as required to show compliance with specified requirements for every manufactured item specified in this section.
- C. Mortar Color Formula: Submit written formula for colored mortar, after color is approved by Architect, so future work can be made to match.
- D. Tests for Efflorescence:
  - 1. Submit laboratory test reports indicating percentage of free alkali in Portland Cement used for mortar for brick masonry. Content of more than 0.6 percent shall be cause for rejection of the cement.

#### 1.6 DELIVERY, STORAGE & HANDLING

- A. Deliver masonry materials in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature, soiling or other causes. Store cementitious materials off the ground, under cover and in dry condition.

#### 1.7 PROJECT CONDITIONS

- A. Protection of Work: During erection, when rain or snow is forecast, cover tops of exposed masonry walls with strong waterproof membrane, well secured in place. Extend protection a minimum of 12 inches down both sides.
- B. Cold Weather Construction: See General Notes on Structural Drawings.

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- C. Hot Weather Construction: See General Notes on Structural Drawings.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Concrete Masonry Units (CMU): ASTM C90, Table 3, medium weight with minimum compressive strength of 1,900 pounds per square inch.
1. Face size: 8 x 16 inches nominal.
  2. Linear shrinkage: Not over 0.045 percent.
  3. Moisture content: Not over 40 percent.
  4. Exposed units: Provide units for exposed construction with fine textured surface, sharp straight arises, and without defects on exposed edges or surfaces which would impair appearance.
  5. Fire rating: 2 hours for 8 inch thick units.
- C. Mortar: Concrete masonry: Type S.
- D. Grout for Concrete Masonry: See General Notes on Structural Drawings.
- E. Portland Cement: ASTM C150, Type I, low alkali type.
- F. Sand: ASTM C 144.
- G. Hydrated Lime: ASTM C270, Type S.
- H. Mortar Pigments: Mineral pigments of high purity, non-fading, limeproof, color(s) as scheduled in Section 09 06 10.
- I. Water: City water, drinkable.
- J. Reinforcing Rods: As noted on Structural Drawings.

#### 2.2 MORTAR MIXES

- A. See Section 04 05 13.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL:

- A. Lay masonry plumb, true to line with level and accurately spaced courses; corners plumb and true; each course breaking joint with course below, unless otherwise shown or specified. Maintain plumb bond.
- B. Step back unfinished work for jointing with new work; toothing not permitted except as approved by Architect. Remove loose mortar before starting new work.
- C. No cracked, chipped, broken, discolored, defaced units or open cells permitted on exposed masonry.
- D. Perform cutting, patching and repairing in connection with masonry work required to accommodate work of other trades.
- E. Use motor driven carborundum saw to cut masonry units. Cut units to provide pattern shown and to fit adjoining work. Use full units without cutting where possible.
- F. Joints: Tool exposed slightly concave unless otherwise shown. Lay masonry units with uniform joint widths. Tool after mortar has taken its initial set.
- G. Provide bar positioners for all vertical reinforcing as per General Notes on structural drawings.
- H. Re-tempering of mortar will be allowed, if non-colored. Colored mortar shall not be re-tempered.



## SECTION 04 22 00 CONCRETE UNIT MASONRY

### 3.2 CONSTRUCTION TOLERANCES:

- A. Variation from Plumb: For vertical lines and surfaces of pilasters, walls and arises do not exceed 1/4 inch in 10 feet, or 3/8 inch in one story height not to exceed 20 feet, nor 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4 inch in any story of 20 feet maximum, nor 1/2 inch in 40 feet or more. For vertical alignment of head joints, do not exceed plus or minus 1/4 inch in 10 feet, 1/2 inch maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 feet maximum, nor 1/2 inch in 40 feet or more.
- C. Variation of Linear Building Line: For position shown in plan and related portion or pilasters, walls and partitions, do not exceed 1/2 inch in any bay or 20 feet maximum, nor 3/4 inch in 40 feet or more.

### 3.3 LAYING CONCRETE MASONRY UNITS

- A. Solidly bed each course in mortar. Butter vertical joints entire length. Bond each course at corners and intersections unless otherwise shown.
- B. Set units with care around frames. Do not bulge frame sides or change position. Building frame anchors into joints. Cut units accurately to fit around pipes, ducts and openings.
- C. Line up courses of exposed work throughout to obtain uniform appearance. Install cut block units at locations where conduits, pipes and similar items are to be enclosed, so that finished appearance will have regular jointing pattern. Provide necessary special jamb, irregular and regular angle units where required to obtain smooth, evenly jointed and regular patterns throughout exposed surfaces.
- D. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
  - 1. Comply with requirements in ACI 530.1 / ASCE 6 / TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  - 2. Limit height of vertical grout pours to not more than 60 inches.
- E. Control Joints: Construct continuous control joints providing unbroken vertical separation through entire wall thickness, in manner shown. Construct control joints throughout unbroken length of interior walls, at approximately 30 foot centers.

### 3.4 POINTING & CLEANING

- A. Execute Work in a clean manner, removing excess materials and mortar dropping daily. Remove mortar droppings on connecting or adjoining work before it has attained final set.
- B. Clean concrete masonry units which are to remain exposed in finished work by wire brushes or other method which will provide a satisfactory result.
- C. Remove and replace defective materials; correct defective workmanship, and leave masonry clean.

END OF SECTION



## SECTION 05 12 00 STRUCTURAL STEEL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Structural steel in accordance with Contract Documents.
- B. Fabrication.
- C. Shop priming.
- D. Erection.
- E. Field painting.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 05 50 00 METAL FABRICATIONS: Miscellaneous metal.
- D. Section 05 31 00 METAL DECK: Hoisting, stud shear connectors.
- E. Section 09 91 00 PAINTING: Field painting, except as specified herein.

#### 1.3 DEFINITIONS

- A. Structural Steel: Generally includes steel fabrications shown on Structural Drawings and as defined by AISC 303-05. It is not the intent of this Section to delineate items that are to be furnished by any one subcontractor. Work furnished under this Section shall be complementary to Section 05 50 00 and it shall be the Contractor's responsibility to coordinate the Work provided under both Sections and ensure that the Work is complete and without duplication.

#### 1.4 REFERENCES

- A. American Institute of Steel Construction (AISC)
  - 1. AISC 303, Code of Standard Practice for Steel Buildings and Bridges.
  - 2. AISC 341 / 341s1, Seismic Provisions for Structural Steel Buildings.
- B. American National Standards Institute (ANSI)
  - 1. ANSI/AISC 360, Specification for Structural Steel Buildings.
- C. American Society of Testing & Materials (ASTM)
  - 1. ASTM A6 / A6M, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling.
  - 2. ASTM A325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - 3. ASTM A490, Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
  - 4. ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 5. ASTM A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
  - 6. ASTM A992 / A992M, Standard Specification for Steel for Structural Shapes.
  - 7. ASTM E164, Standard Practice for Obtaining Spectrometric Data for Object-Color Evaluation.
  - 8. ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55 and 105-ksi Yield Strength.
- D. American Welding Society (AWS)
  - 1. AWS D1.1 / D1.1M, Structural Welding Code - Steel.
  - 2. AWS D1.3, Structural Welding Code - Sheet Steel.
- E. International Code Council (ICC):
  - 1. International Building Code (IBC), 2006 Edition as amended by State of Washington.
- F. Research Council on Structural Connections (RSCS):
  - 1. RSCS Specification for Structural Joints Using ASTM A325 or A490 Bolts.

- G. The Society for Protective Coatings (SSPC)
  - 1. SSPC Painting Manual, 2 volumes, 2005 Edition.

#### 1.5 QUALITY ASSURANCE

- A. Reference Standards: Except as modified by governing Codes and by this Specification, comply with applicable provisions and recommendations of the following:
  - 1. AISC 303.
  - 2. ASTM A992 / A992M.
  - 3. RSCS Specification for Structural Joints using ASTM A325 or A490 Bolts.
  - 4. AWS D1.1.
  - 5. ASTM A6 / A6M.
  - 6. ASTM F1554.
  - 7. SSPC Painting Manual, Vol. 2, Systems and Specifications.
- B. Qualification of Fabricator: See General Notes on Structural Drawings.
- C. Qualification of Welding Work: Qualify welding processes and welding operation in accordance with AWS "Standard Qualification Procedure."
- D. Quality Control:
  - 1. Owner will engage services of testing agency for testing and special inspection of structural steel. Provide testing agency with the following:
    - a. Complete set of accepted documents required under Article 1.6 "Submittals" of this Section.
    - b. Full and ample means and assistance for testing material.
  - 2. Assign identifying symbol or mark to each person installing connections. Identify shop and field connections so inspector can refer back to person making connection.
  - 3. Materials and fabrication procedures are subject to inspection and tests in shop and field. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements. Inspector will perform his duties, when possible, in such a way that fabrication and erection are not unnecessarily delayed or impeded.
  - 4. High strength bolting: In accordance with RCSC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" and International Building Code, Chapter 22.
  - 5. Welding: Inspector will make tests and inspections during fabrication and erection of structural steel assemblies as follows:
    - a. Verify welder qualifications and conduct inspections and tests as required. Record types and locations of defects found in Work. Record Work required and performed to correct deficiencies.
    - b. Perform visual inspection of all welds.
    - c. The following method will also be used where scheduled on Structural Drawings:
      - 1) Ultrasonic testing: ASTM E164.

#### 1.6 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Show fabrication of structural steel components.
  - 1. Include details of cuts, connections, splices, camber, holes and other pertinent data. Identify exposed architectural steel items.
  - 2. Include embedment drawings.
  - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld.
  - 4. Indicate type, size and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
  - 5. Cleaning and painting schedules.

- C. Mill Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
    - 1. Structural steel including chemical and physical properties.
    - 2. Bolts, nuts and washers including mechanical properties and chemical analysis.
    - 3. Direct-tension indicators.
    - 4. Tension-control, high-strength bolt-nut-washer assemblies.
- 1.7 DELIVERY, STORAGE & HANDLING
- A. Delivery: Plan method and sequence to avoid delay and damage to Work of other trades.
  - B. Storage: Minimum amounts of materials may be stored at site; place in manner to prevent distortion and damage to members.
  - C. Protection: Protect against corrosion, deterioration and soiling from construction operations. Materials damaged due to improper storage will be rejected.
- 1.8 PROJECT/SITE CONDITIONS
- A. Base erection upon use of metal floor decking as a safety and construction floor in areas shown to receive metal floor decking. In other areas, provide safety planking.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Structural Steel: ASTM A992 / A 99M unless otherwise shown.
- B. Cold-Formed Steel Tubing (HSS): ASTM A500, Grade B.
- C. Hot-Formed Steel Tubing: ASTM A501.
- D. Steel Pipe: ASTM A53, Type E or S, Grade B; or ASTM A501.
- E. High-Strength Bolts and Nuts: See Structural Drawings.
- F. Anchor Bolts and Rods: ASTM F1554.
- G. Electrodes for Carbon Steel: E70XX.
- H. Clevises, Rods and Turnbuckles: C-1035 carbon steel as manufactured by Cleveland City Forge or equal.
- I. Primer Paint: SSPC-Paint 25, Type 11.
- J. Shrinkage-Resistant Grout: See Structural Drawings.
- K. Bearing Pads: See Structural Drawings.
- L. Bituminous Paint: Carboline "Bitumastic No. 50" or equal.

### 2.2 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303-05 and ANSI / AISC 360-05.
  - 1. Camber structural steel members where indicated.
  - 2. Identify high strength structural steel according to ASTM A6 / A6M and maintain markings until structural steel has been erected.
  - 3. Mark and match-mark materials for field assembly.
- B. Drill or punch holes at right angles to surface of metal, no more than 1/16 inch larger than connector diameter. Do not make or enlarge holes by burning. Drill material having thickness in excess of connector diameter and material thicker than 7/8 inch. Leave holes clean-cut without tom or ragged edges. Remove outside burrs.
- C. Provide holes in members to permit connection of Work of other trades. Use suitable templates for proper location of holes. Provide slotted holes for steel requiring adjustment. Where openings are shown on Drawings or Shop Drawings, no change in location permitted without prior approval.
- D. Perform manual oxygen cutting with mechanically guided torch. Unguided torch may be used provided cut is within 1/8 inch of required line.

## 2.3 SHOP CONNECTIONS

- A. High Strength Bolts: Shop install high strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint type: Snug tightened unless otherwise noted.
- B. Weld Connections: Comply with AWS D1.1 and approved Specifications for welding procedure Specifications, tolerances, appearance and quality of welds and for methods used in correcting welding Work.

## 2.4 SURFACE PREPARATION

- A. Columns, beams and girders which are to receive spray fireproofing or concrete encasement shall be unpainted and clean of loose rust, heavy mill scale, oil or other foreign substance and shall be delivered to the Project site in this condition.
  - 1. Power brushing or light sand blasting and solvent to clean oil should suffice.
  - 2. Tight mill scale and minor rust will be permitted.
- B. Steel to be Prime Painted: SSPC-SP2, "Hand Tool Cleaning" or better.

## 2.5 SHOP PAINTING

- A. Shop-Coat-Paint the Following Structural Steel:
  - 1. Steel framing not scheduled to receive spray fireproofing.
  - 2. Elevator separator beams.
- B. Apply specified primers to provide minimum dry film thickness of 1.5 mils, except for milled surfaces. Do not paint when surface temperature of steel is below temperature at which condensations will occur. Apply paint thoroughly and evenly to dry surfaces in accordance with manufacturer's directions. Do not paint the following:
  - 1. Surfaces to be field welded.
  - 2. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
  - 3. Surfaces to be high strength bolted with slip-critical connections.

# PART 3 - EXECUTION

## 3.1 EXECUTION

- A. Verify elevations of concrete-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Provide temporary shores, guys, braces and other supports during erection to keep structural steel secure, plumb and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections and bracing are in place, unless otherwise indicated.

## 3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303-05 and ANSI / AISC 360.
- B. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
  - 1. Set base and bearing plates for structural members on wedges, shims or setting nuts as required.
  - 2. Weld plate washers to top of base plate.
  - 3. Snug tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.

4. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
  - C. Maintain erection tolerances of structural steel within AISC 303.
  - D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
    1. Level and plumb individual members of structure.
    2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
  - E. Splice members only where indicated.
  - F. Do not use thermal cutting during erection unless approved by Structural Engineer. Finish thermally cut sections within smoothness limits in AWS D1.1.
  - G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- 3.4 FIELD CONNECTIONS
- A. High Strength Bolts: Install high strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type joint specified.
    1. Joint type: Snug tightened.
  - B. Weld Connections: Comply with AWS D1.1 and approved Specifications for welding procedure specifications, tolerances, appearance and quality of welds and for methods used in correcting welding work.
    1. Comply with AISC 303 and ANSI / AISC 360 for bearing, adequacy of temporary connections, alignment and removal of paint on surfaces adjacent to field welds.
- 3.5 FIELD PAINTING
- A. Comply with requirements specified in Article 2.5, "Shop Painting" of this Section.
  - B. After erection, clean exposed surfaces of field connections, unpainted areas adjacent to field connections and damaged areas in shop coat to same standards required for shop coat. Paint with same primer used in shop coat.
  - B. Field apply primer to bolts prior to top coating.
  - C. Touch up coating that is damaged by re-torquing of bolts after top coating.
- 3.6 BELOW GRADE CORROSION PROTECTION
- A. Bituminous Paint: Apply to all portions of structural steel below grade which are not to be encased in concrete. Provide paint coverage in quantity recommended by manufacturer. Paint base plates, nuts, grout and extend onto footings 4 inches.
- 3.7 FIELD QUALITY CONTROL
- A. Field testing and inspection requirements shall comply with Paragraph 1.5 D "Quality Control" of this Section.

END OF SECTION





## SECTION 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide AESS in accordance with THE Contract Documents.
- B. Requirements regarding appearance and surface preparation of AESS.
- C. Refer to Section 05 12 00 for all other requirements regarding steel Work not specified in this Section.
- D. Shop priming.
- E. Field quality control.
- L. This Section applies to any members noted on Architectural and Structural Drawings as AESS [and in the areas defined as AESS below].
  - 1.
  - 2.
  - 3.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 05 12 00 - STRUCTURAL STEEL: Additional requirements.
- D. Section 05 50 00 - METAL FABRICATIONS: Miscellaneous metal.
- E. Section 05 31 00 - METAL DECK: Hoisting, stud shear connectors.
- F. Section 09 96 00 - HIGH PERFORMANCE COATINGS FOR STEEL: Field painting, except as specified herein.
- G. STRUCTURAL DRAWINGS: General Notes for additional requirements.

#### 1.3 REFERENCES

- A. American Institute of Steel Construction (AISC):
  - 1. AISC 303, Code of Standard Practice for Steel Buildings and Bridges.
- B. American Welding Society (AWS):
  - 1. AWS D1.1 / D1.1M-06: Structural Welding Code - Steel.
- C. The Society for Protective Coatings (SSPC):
  - 1. SSPC Painting Manual, 2 volumes.

#### 1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: In addition to those qualifications listed in Section 05 12 00, engage a firm experienced in fabricating AESS similar to that indicated for this Project with a record of successful in-service performance, as well as sufficient production capacity to fabricate AESS without delaying the Work.
- B. Erector Qualifications: In addition to those qualifications listed in Section 05 12 00 engage an experienced erector who has completed AESS Work similar in material, design and extent to that indicated for this Project and with a record of successful in-service performance.
- C. Comply with applicable provisions of the following Specifications and documents:
  - 1. AISC 303, Section 10 as amended herein.
- D. Pre-Installation Conference: The General Contractor shall schedule and conduct conference at the Project Site. As a minimum, the meeting shall include the General Contractor, fabricator, erector, the finish-painting subcontractor and the Architect. Coordinate requirements for shipping, special handling, attachment of safety cables and temporary erection bracing, touch up painting and other equipment for AESS.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Each type of product specified.
- C. Shop Drawings Detailing Fabrication of AESS Components:
  - 1. Provide erection drawings clearly indicating which members are considered AESS members.

## SECTION 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)

2. Include details that clearly identify all requirements listed in Article 2.3 of this Section.
  3. Provide connections for exposed AESS consistent with concepts shown on the Architectural or Structural Drawings.
  3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined herein.
  4. Indicate type, size, finish and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tensioned shear / bearing connections. [Indicate to which direction bolt heads should be oriented.]
  5. Clearly indicate which surfaces or edges are exposed and what class of surface preparation is being used.
  6. Indicate special tolerances and erection requirements as noted on the Drawings or defined herein.
- D. Qualification data for firms and persons specified under Article 1.4 of this Section to demonstrate their capabilities and experience. Include lists of completed projects names and address, names and addresses of architects and owners, and other information specified.

### 1.6 MOCK-UP

- A. At least 4 weeks prior to fabricating AESS, construct mock-up to demonstrate aesthetic effects as well as qualities of materials and execution. A mock-up for each of the following elements shall be constructed. *[Delete this article if no special connections will be provided.]*
1. ???
- B. Build mock-up to comply with the following requirements, using materials indicated for final unit of Work.
1. Locate mock-up on-site or in the fabricator's shop as directed by Architect. Mock-up shall be full-size unless Architect approves smaller models.
  2. Notify Architect 5 working days in advance of dates and times when mock-up will be available for review.
  3. Demonstrate proposed range of aesthetic effects regarding each element listed under Article 2.3 of this Section.
  4. Mock-up shall have finished surface (including surface preparation and paint system).
  5. Obtain Architect's written approval of mock-up before starting fabrication of final units.
  6. Retain and maintain mock-up during construction in an undisturbed condition as a standard for judging completed Work.
    - a. Approved mock-up in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

### 1.7 DELIVERY, STORAGE & HANDLING

- A. Store materials to permit easy access for inspection and identification.
- B. Keep steel members off ground by using pallets, platforms or other supports.
- C. Protect steel members and packaged materials from erosion and deterioration.
- D. Use special care in handling to prevent twisting or warping of AESS members.
- E. Erect pre-painted finish pieces using padded slings or other methods such that they are not damaged.
- F. Provide padding as required to protect while rigging and aligning member's frames.
- G. Weld tabs for temporary bracing and safety cabling only at points concealed from view in the completed structure or where approved by Architect during pre-installation meeting.
- H. Methods of removing temporary erection devices and finishing of AESS members shall be approved by Architect prior to erection.

### 1.8 PROJECT CONDITIONS

## SECTION 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)

- A. Field Measurements: Where AESS is indicated to fit against walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on shop drawings.
- B. Coordinate fabrication Schedule with construction progress to avoid delaying the Work.

### 1.9 COORDINATION

- A. Coordinate installation of anchors for AESS members that connect to Work of other trades.
- B. Furnish setting Drawings, templates and directions for installing anchors, including sleeves, concrete inserts, anchor bolts and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project Site in time for installation.
- C. Anchorage concepts shall be as indicated on Contract Drawings and approved on final Shop Drawings.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Meet requirements of Section 05 12 00 as amended below.
- B. High-Strength Bolts, Nuts and Washers: Per Section 05 12 00 heavy hex heads and nuts [Provide rounded bolt heads and twist-off bolts]. Provide standard carbon steel [Cadmium plated] [Mechanically galvanized] finish.

### 2.2 PRIMERS

- A. Compatibility: The General Contractor shall submit all components / procedures of paint system for AESS as a single coordinated submittal.
  - 1. As a minimum, identify required surface preparation and primer. Identify intermediate coat and finish coat (if applicable). All items shall be coordinated with finish coat specified in Section 09 96 00.
- B. Primers: As specified under Section 09 96 00.

### 2.3 FABRICATION

- A. Shop fabricate and assemble AESS to greatest extent possible.
- B. Locate field joints in AESS assemblies at concealed locations or as approved by Architect.
- C. Detail AESS assemblies to minimize field handling and expedite erection.
- D. Fabricate AESS with exposed surfaces smooth, square and of surface quality consistent with approved mock-up.
- E. Use special care in handling and shipping of AESS both before and after shop painting.
- F. In addition to special care used to handle and fabricate AESS, employ the following fabrication techniques.
  - 1. Fabrication tolerances:
    - a. Fabricate steel to one-half the normal tolerance as specified in Section 10 of AISC 303 where AESS assembly is adjacent to aluminum window wall and aluminum curtain wall assemblies.
    - b. Fabricate steel to standard frame tolerances for structural steel per Chapter 7 of AISC 303 at all other locations.
  - 2. Welds ground smooth: Not required.
  - 3. Contouring and blending of welds: Not required.
  - 4. Continuous welds: Where welding is noted on Drawings, provide continuous welds of uniform size and profile.
  - 5. Minimize weld show through: At locations where welding on the far side of an exposed connection occurs, grind distortion and marking of the steel to a smooth profile with adjacent material.
  - 6. Coping and blocking tolerance: Maintain a uniform gap of 1/8 inch plus or minus 1/32 inch at all copes and blocks.
  - 7. Joint gap tolerance: Maintain a uniform gap of 1/8 inch plus or minus 1/32 inch.

## SECTION 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)

8. Piece marks hidden: Fabricate such that piece marks are fully hidden in final structure or made with such media to permit full removal after erection.
9. Mill mark removal: Fabricator shall deliver steel with no mill marks (stenciled, stamped, raised, etc) as listed below. Mill marks shall be omitted by cutting of mill material to appropriate lengths where possible. Where not possible, the fabricator may fill and/or grind to match surface finish consistent with the approved mock-up. LOCATIONS:
  - a. Building Interior: No mill marks in AESS.
  - b. Building Exterior: No mill marks visible within 10 feet of adjacent walking surface.
10. Grinding of sheared edges: Grind all edges of sheared, punched or flame cut steel [to match approved mock-up].
11. Rolled members: Members specified to be rolled to a final curved shape shall be fully shaped in the shop and tied during shipping to prevent stress relieving. Distortion of the web or stem, and of outstanding flanges or legs of angles shall be visibly acceptable to Architect from a distance of 20 feet under any lighting condition determined by Architect. Tolerances for vertical and horizontal walls of rectangular HSS members after rolling shall be specified dimension plus or minus 1/2 inch.
12. Seal weld open ends of round and rectangular hollow structural section with 3/8 inch closure plates. Provide continuous, sealed welds at angle to gusset-plate connections and similar locations where AESS is exposed to weather.

### 2.4 SHOP CONNECTIONS

- A. Bolted Connections: Make in accordance with Section 05 12 00. Provide bolt type and finish as noted herein and align bolt heads as indicated on approved Shop Erection Drawings.
- B. Welded Connections: Comply with AWS D1.1 and Section 05 12 00. Appearance and quality of welds shall be consistent with mock-up.
- C. Assemble and weld built-up sections by methods that will maintain alignment of members without warp exceeding the tolerance of this Section.

### 2.5 SHOP PRIMING

- A. Shop-prime steel surfaces, except the following:
  1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
  2. Surfaces to be field welded.
  3. Surfaces to be high-strength bolted with slip-critical connections, if primer does not meet specified AISC slip coefficient.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Prepare surfaces according to SSPC Specifications as follows:
  1. SSPC-SP 6, "Commercial Blast Cleaning," for all exterior AESS.
  2. SSPC-SP 3, "Power Tool Cleaning," for all interior AESS.
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges and exposed surfaces.
  1. Stripe paint corners, crevices, bolts, welds and sharp edges.
  2. Apply 2 coats of shop primer to surfaces that are inaccessible after assembly or erection.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Check all AESS members upon delivery for twist, kinks, gouges or other imperfections which might result in rejection of the appearance of the member. Coordinate remedial action with fabricator prior to erecting steel.

### 3.2 PREPARATION

- A. Provide connections for temporary shoring, bracing and supports only where noted on the approved shop drawings.
- B. Temporary connections not shown shall be made at locations not exposed to view in the final structure or as approved by Architect.
- C. Handle, lift and align pieces using padded slings and/or other protection required to maintain the appearance of the AESS through the process of erection.

### 3.3 ERECTION

- A. Set AESS accurately in locations and to elevations indicated, and according to AISC Specifications referenced in this Section.
- B. In addition to the special care used to handle and erect AESS, employ the following erection techniques:
  - 1. AESS erection tolerances:
    - a. Meet requirements of Section 10 of AISC 303 where AESS assembly is adjacent to aluminum window wall and aluminum curtain wall assemblies. *[Tolerances limited to 1/2 of standard structural steel.]*
    - b. Meet requirements of standard frame tolerances for structural steel per Chapter 7 of AISC 303 at all other locations. *[Standard structural steel tolerances.]*
  - 2. Welds ground smooth: Not required.
  - 3. Contouring and blending of welds: Not required.
  - 4. Continuous welds: Where noted on Drawings, provide continuous welds of uniform size and profile.
  - 5. Minimize weld show-through: At locations where welding on far side of exposed connection occurs, grind distortion and marking of steel to a smooth profile with adjacent material.
  - 6. Bolt head orientation: All bolt heads shall be oriented as indicated on the Contract Documents. Where bolt-head alignment is specified, orientation shall be noted for each connection on Erection Drawings. Where not noted, bolt heads in a given connection shall be oriented to one side.
  - 7. Removal of field connection aids: Run-out tabs, erection bolts and other steel members added to connections to allow for alignment, fit-up and welding in field shall be removed from structure. Field groove welds shall be selected to eliminate need for backing bars or to permit their removal after welding. Welds at run-out tabs shall be removed to match adjacent surfaces and ground smooth. Holes for erection bolts shall be plug welded and ground smooth.
  - 8. Filling of weld access holes: Where holes must be cut in the web at the intersection with flanges on wide flange "W" shapes and structural tees to permit field welding of the flanges, they shall be filled. Filling shall be executed with proper procedures to minimize restraint and address thermal stresses in group 4 and 5 shapes.
- C. Field Welding: Weld profile, quality and finish shall be consistent with fabrication mock-ups [and approved prior to fabrication].
- D. Splice members only where indicated or locations concealed from view in finished Work.
- E. Obtain permission for any torch cutting or field fabrication from the Architect. Finish sections thermally cut during erection to a surface appearance consistent with the mock-up.
- F. Do not enlarge unfair holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts. Replace connection plates that are misaligned where holes cannot be aligned with acceptable final appearance.

### 3.4 FIELD CONNECTIONS

- A. Bolted Connections: Install bolts of the specified type and finish in accordance with Section 05 12 00.

## SECTION 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)

- B. Welded Connections: Comply with AWS D1.1 for procedures, and appearance. Refer to Section 05 12 00.
  - 1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp. Verify that weld sizes, fabrication sequence and equipment used for AESS will limit distortions to allowable tolerances.
  - 2. Obtain Architect's approval for appearance of welds in repaired or field modified work.
- 3.5 FIELD QUALITY CONTROL
  - A. AESS Acceptance: The Architect shall observe AESS steel in place and determine acceptability based on visual inspection and conformance to approved mock-up.
- 3.6 ADJUSTING & CLEANING
  - A. Touch-Up Painting: Clean and touch-up paint of field welds, bolted connections and abraded areas of shop paint to blend with adjacent surfaces of AESS using specified primers.

END OF SECTION

## SECTION 05 31 00 METAL DECKING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Metal floor and roof decking in accordance with Contract Documents.
- B. Accessories.
- C. Field Quality Control.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 45 21 TESTING LABORATORY SERVICES: Testing.
- D. Section 03 30 00 CAST-IN-PLACE CONCRETE: Concrete fill.
- E. Section 05 12 00 STRUCTURAL STEEL: Hoisting of Metal Decking.
- F. Section 09 22 16 NON-STRUCTURAL METAL FRAMING: Ceiling Hangers.
- G. Section 09 53 23 METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES: Ceiling Hangers.
- H. STRUCTURAL DRAWINGS: General Notes for additional requirements.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM A653 / A653M, Standard Specification for Steel, Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
  - 3. ASTM A1008 / A1008M, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution-Hardened, and Bake-Hardenable.
- B. American Welding Society (AWS):
  - 1. AWS D1.1 / D1.1M, Structural Welding Code - Steel.
  - 2. AWS D1.3, Structural Welding Code - Sheet Steel.
- C. FM Global (FMG)
  - 1. SKU-1-28, Property Loss Prevention Data Sheet - *Design Wind Loads* for Wind loads to roof systems and roof deck securement.
  - 2. SKU-P7825CD, Approval Guide, Building Materials, latest edition.
- D. Steel Deck Institute (SDI):
  - 1. SDI Publication No. 30, Design Manual for Composite Decks, Form Decks and Roof Decks.

#### 1.4 QUALITY ASSURANCE

- A. Reference Standards: Except as modified by governing Codes and these Specifications, comply with the Standards listed under Article 1.3 above.
- B. Qualification of Welding Work: Welder shall be currently certified under AWS "Standard Qualification Procedure" for this type of Work.
- C. Testing Agency: Selected and paid for by Owner; retesting paid for by subcontractor.
- D. FM Global Listing: Provide steel roof deck units that have been evaluated by FM Global and are listed in "FM Global Approval Guide" for "Class I" fire-rated construction.

#### 1.5 SUBMITTALS

- A. Submittal Procedure: See Section 01 33 00.
- B. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these Specifications.
- C. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details and conditions requiring closure panels, supplementary framing, cut openings, special jointing and accessories.

## SECTION 05 31 00 METAL DECKING

### 1.6 PRODUCT HANDLING (for fireproofed deck, where indicated)

- A. Provide decking free of oil lubricant which would impair the adhesion of sprayed fireproofing.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Steel for Painted Metal Deck Units: ASTM A1008 / A1008M, shop primed with gray or white baked-on, lead- and chromate-free, rust-inhibitive primer.
- B. Steel for Galvanized Metal Deck Units: ASTM A653 / A653M, grade as required to comply with SDI specifications, G60 (G90) zinc coating.
- C. Sheet Metal Accessories: ASTM A653 / A653M, G60 (G90) zinc coating.
- D. Accessories: Provide accessories required for complete installation of metal decking. Include the following:
  - 1. Column closures, end closures, Z-closures and cover plates: Steel sheet, of same material, finish and thickness as deck, unless otherwise indicated.
  - 2. Edge forms (metal closures): Gauge as required or sized by deck manufacturer for length of cantilever. The table in deck manufacturer's floor deck catalog shall be used for sizing in the absence of any other published criteria.
  - 3. Mechanical fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
  - 4. Side-lap fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
  - 5. Flexible closure strips: Vulcanized, closed-cell, synthetic rubber.
  - 6. Weld washers: Uncoated steel sheet, shaped to fit deck rib, 0.0747 inch thick, with factory punched hole of 3/8 inch minimum diameter.
- E. Shear Connectors: Through-deck stud welded shear connectors, as specified on Structural Drawings.
- F. Galvanizing Repair Paint: ASTM A780, with dry film containing a minimum of 94 percent zinc dust by weight.
- G. Paint: Manufacturer's baked-on, rust-inhibitive paint, for application to metal surfaces that have been chemically cleaned and phosphate chemical treated.

### 2.2 FABRICATION

- A. Manufacturer: Epic Metals Corp. Designs are indicated on Structural Drawings. Other manufacturers' products meeting requirements of the Contract Documents may be provided.
- B. Profiles:
  - 1. Epicore floor and roof decking.
  - 2. ED450 at exterior canopies on existing L-Wing.
  - 3. ED600 at exterior canopy over Patient Drop-Off.
- C. General: Span floor and roof units over at least 3 spans where possible.
  - 1. Gauges are shown on Structural Drawings.
  - 2. Decking shall be of minimum 20 gauge if not shown otherwise.
  - 3. Shore deck spans requiring shoring from same framing level as supporting deck.
- D. Metal Closure Strips: Where steel edge angles are not provided, fabricate metal closure strips for openings between decking and other construction.
  - 1. Form to provide tight fitting closures at open ends of cells or flutes and sides of decking.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.



## 3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable Specifications and Commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements of this Section.
- B. Locate decking bundles to prevent overloading of supporting members.
- C. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- D. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- E. Cut and neatly fit deck panels and accessories around openings and other Work projecting through or adjacent to decking.
- F. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking and support of other Work.
- G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding Work.

## 3.3 ROOF DECK INSTALLATION

- A. Fasten roof deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter, but not less than 1-1/2 inches long, and as follows:
  - 1. Weld diameter: Nominal.
  - 2. Weld spacing: Weld edge and interior ribs of deck units with a minimum of two (2) welds per deck unit at each support. Space welds maximum 12 inches apart in the field of the roof and 6 inches apart in roof corners and perimeter, based on roof area definitions of FMG SKU-1-28.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 36 inches, and as follows:
  - 1. Mechanically fasten with self-drilling No. 10 diameter or larger carbon-steel screws.
  - 2. Mechanically clinch or button punch.
  - 3. Fasten with a minimum of 1-1/2 inch long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches with end joints as follows:
  - 1. End joints: Lapped 2 inches minimum.
- D. Miscellaneous Roof Deck Accessories: Install ridge and valley plates, finish strips, cover plates, end closures and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
- E. Flexible Closure Strips: Install flexible closure strips over partitions, walls and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

## 3.4 FLOOR DECK INSTALLATION

- A. Fasten floor deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
  - 1. Weld diameter: Nominal.
  - 2. Weld spacing: Space and locate welds as indicated.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports at intervals not exceeding the lesser of 1/2 of the span or 36 inches, and as follows:
  - 1. Mechanically clinch or button punch.
  - 2. Fasten with a minimum of 1-1/2 inch long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches with end joints butted.

## SECTION 05 31 00 METAL DECKING

- D. Shear Connectors: Weld shear connectors through deck to supporting frame according to AWS D1.1 and manufacturer's written instructions. Remove and discard arc shields after welding shear connectors.
- E. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.
- F. Floor Deck Closures: Weld steel sheet column closures, cell closures, and Z closures to deck, according to SDI recommendations, to provide tight fitting closures at open ends of ribs and sides of decking. Weld cover plates at changes in direction of floor deck panels, unless otherwise indicated.

### 3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing agency to perform field quality control testing under provisions of Section 01 45 21.
- B. Field welds will be subject to inspection.
- C. Shear connector stud welds will be inspected and tested according to AWS D1.1 for stud welding and as follows:
  - 1. Shear connector stud welds will be visually inspected.
  - 2. Bend tests will be performed if visual inspections reveal less than a full 360 degree flash or welding repairs to any shear connector stud.
  - 3. Tests will be conducted on additional 5 percent of all shear connector studs.
- D. Testing agency will report test results promptly and in writing to in accordance with the provisions of Section 01 45 21.
- E. Remove and replace Work that does not comply with requirements of the Contract Documents.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected Work with requirements of the Contract Documents.

### 3.6 REPAIRS & PROTECTION

- A. Galvanized Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds and abraded areas on surfaces of prime-painted deck immediately after installation, and apply repair paint.

END OF SECTION

## SECTION 05 41 00 STRUCTURAL METAL STUD FRAMING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Load-bearing metal stud systems in accordance with the Contract Documents.
- B. Exterior load-bearing wall framing.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product Data, Samples, and Certificates.
- C. Section 01 45 21 - TESTING LABORATORY SERVICES.
- D. Section 05 12 00 - STRUCTURAL STEEL: for structure.
- E. Section 05 31 00 - STEEL DECKING: for substrate.
- F. Section 06 16 00 - SHEATHING: for gypsum board sheathing applied to exterior wall framing.
- G. Section 05 50 00 - METAL FABRICATIONS: for masonry shelf angles and connections.
- H. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: for gypsum board applied to interior wall framing.
- I. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: for deflection head tracks.
- J. Structural Drawings: Additional requirements General Notes.

#### 1.3 REFERENCES

- A. American Institute of Steel Construction (AISC):
  - 1. Specifications for Design of Cold Formed Steel Structural Members.
- B. ASTM International (ASTM):
  - 1. ASTM A653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by Hot Dip Process.
  - 2. ASTM A924, Standard Specification for General Requirements for Steel Sheet Metallic-Coated by Hot-Dip Process.
  - 3. ASTM A1003, Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
  - 4. ASTM A1008, Standard Specification for Steel Sheet and Strip, Hot-Rolled, Carbon, Structural High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability.
  - 5. ASTM C926, Standard Specification for Application of Portland Cement-Based Plaster.
  - 6. ASTM C954, Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks) and Bracing or Bridging for Screw Application of Gypsum Panel Products and Plaster Bases.
  - 7. ASTM C955, Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.
  - 8. ASTM C1007, Standard Specification for Installation of Structural (Axial and Transverse) Steel Framing Members and Accessories.
  - 9. ASTM E488, Standard Test Methods of Strength Anchors in Concrete and Masonry.
  - 10. ASTM E1190, Standard Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members.
- C. American Welding Society (AWS)
  - 1. AWS D1.0, Structural Welding Code - Steel.
  - 2. AWS D1.3, Structural Welding Code - Sheet Steel.
- D. International Code Council (ICC):
  - 1. International Building Code (IBC), 2006 Edition as amended by State of Washington.

#### 1.4 QUALITY ASSURANCE

- A. Re-rolled steel and members containing factory welds will not be permitted.

## SECTION 05 41 00 STRUCTURAL METAL STUD FRAMING

- B. Cold-formed framing members shall be identified with manufacturer's name, minimum bare steel thickness, and yield strength per ASTM C955 along each member's full length at 48-inch centers.

### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Submit drawings showing framing, connection details, accessories and anchorage. Indicate location of assemblies, size and spacing of framing components.
- C. Product Data: Submit manufacturer's catalog data for each item proposed for installation.
- D. Certificates: Furnish manufacturer's certification that materials meet or exceed Specification requirements.

### 1.6 PRODUCT DELIVERY, STORAGE & HANDLING

- A. All materials shall be delivered in their original unopened packages and stored protected from damage. Do not store material directly on grade. Provide adequate support to prevent bowing of material prior to installation.
- B. Store welding electrodes in accordance with AWS D12.1.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide studs, tracks, joists and accessories manufactured by current member of Steel Stud Manufacturers Association (SSMA).

### 2.2 MATERIALS

- A. Light Gage Metal Framing:
  - 1. Metal framing shall be formed from corrosion resistant-steel conforming to requirements of ASTM A653, 50 ksi minimum
  - 2. Metal framing shall be zinc coated in conformance to requirements of ASTM A926, G60.
  - 3. Metal framing shall be manufactured in conformance to ASTM C955.
  - 4. Install metal framing per ASTM C1007, Standard Specification for Installation of Load-Bearing (Transverse and Axial) Steel Studs and Related Accessories.
- B. Gages and properties of studs shall be as indicated on Drawings.
- C. Mechanical anchors to concrete and masonry shall be metal cinch at least 3/8 inch in diameter threaded bolt head type. Anchor bolts to be installed in concrete shall be hook type 1/2 inch diameter or more. Unless otherwise indicated.
- D. Mechanical anchors to metal framing shall be No. 10 self-tapping and self-drilling wafer-head screws.
- E. Accessories: Special top tracks, angles, fasteners, and strips of gypsum wallboard, as required for fire rating assembly required at each condition.
- F. Mineral Wool: Thermafiber Safing Insulation.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install plumb and true. Install necessary accessories for proper installation.
- B. Anchor top and bottom runner track to ceiling or roof structure overhead and to floor structure below.
- C. Install studs squarely in top and bottom runner track with firm abutment against track webs.
- D. Align and plumb studs, and fasten to flanges of both top and bottom runner tracks.
- E. Provide 3 studs minimum at corners of stud walls. Locate so as to provide surfaces for attachment of interior and exterior facing materials.
- F. Members not indicated to be welded together shall be attached with manufacturer recommended screws with minimum one screw at each flange of stud to top and bottom track. Wire tying of framing members is not permitted.

## SECTION 05 41 00 STRUCTURAL METAL STUD FRAMING

- G. Provide lateral bracing and bridging in accordance with manufacturer's written recommendations or as required by ICC.
- H. Intersecting walls and partitions, whether load-bearing or not, shall be connected.
- I. Splices in axially loaded studs are not permitted.
- J. Splice or butt weld butt joints in runner tracks. No splices are permitted in tracks over lintels, diaphragm sheathing, or diagonal bracing.
- K. Weld connections by fillet welds or plug welds in accordance with AWS recommended procedures and practices.
- L. Touch-up field abrasions and welds with galvanizing touch-up material.
- M. Studs that frame door openings shall be clipped to floor with 14 gage angle clips. Each clip to have two fasteners into studs and two fasteners into floor.
- N. Provide additional joists or blocking adjacent to exterior and interior walls, openings and elsewhere as required to provide support for indicated ceiling construction.
- O. Provide an additional joist under parallel partitions where partition length exceeds 1/2 joist span and around floor and roof openings which interrupt one or more spanning members.

### 3.2 TOLERANCES

- A. Install walls and partitions on straight lines, plumb, free of twists or other defects, and contacting a 10 foot straightedge for its entire length at any location within a 1/8 inch tolerance. Install horizontal framing level within a tolerance of 1/8 inch in 12 feet in any direction.

### 3.3 THERMAL INSULATION

- A. Place thermal insulation in multiple stud spaces made inaccessible after erection.
- B. Place thermal insulation equal to that specified under Section 07 21 00 in all doubled jamb studs and headers not accessible to the insulation subcontractor.

### 3.4 CONNECTIONS TO STEEL DECKING

- A. Provide premolded neoprene filler strips matching flute profile for non-fire-rated walls and partitions covered on one or both sides up to metal decking.
- B. Top runner track of fire-rated partitions shall be a minimum of 20 gage, unless noted otherwise, and attached to metal deck with required fasteners at spacing required for fire rating, but in no case over 16 inches on center. Areas above runner shall be friction fit with a minimum depth of 2-1/2 inches of 4 pounds per cubic foot density mineral wool insulation. A minimum of 1/2 inch of firestopping compound shall be installed to each side of mineral wool insulation for a one-hour system, and one inch of firestopping for a 2-hour system. Install required special tracks, angles, fasteners and strips of gypsum wallboard to provide required fire resistance rating.
- C. Proprietary fire-rated top tracks shall be installed in accordance with manufacturer's recommendations and fire rating approval requirements.

### 3.5 FIELD QUALITY CONTROL

- A. Welding Inspection:
  - 1. Inspection of field welding operations shall be performed by special inspector.
  - 2. The special inspector shall inspect material, equipment, procedures, welds, and welder qualifications.

### 3.6 CLEAN UP

- A. Remove rubbish, debris, and waste materials and legally dispose of off Project Site.

### 3.7 PROTECTION

- A. Protect Work of this Section until Substantial Completion.

END OF SECTION



## SECTION 05 45 23 HEALTHCARE METAL SUPPORTS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Bidder-designed metal support systems for medical equipment as required in accordance with the Contract Documents.
- B. Where Required:
  - 1.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Shop Drawings.
- C. Section 01 36 00 - DELEGATED DESIGN REQUIREMENTS: Bidder-design requirements.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM A153 / ASTM A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. ASTM A1011 / A1011M, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, High-Strength Low Allow With Improved Formability, and Ultra High-Strength.
  - 3. ASTM A575, Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades.
  - 4. ASTM A653 / A653M, Standard Specification for Steel, Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. American Welding Society (AWS):
  - 1. AWS D1.1 / D1.1M, Structural Welding Code - Steel.
- C. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.

#### 1.4 QUALITY ASSURANCE

- A. All items of Work of this Section shall be furnished by Bidder-Design Contractor to assure undivided responsibility.
- B. Bidder-Design Contractor shall be responsible for furnishing the complete package which shall include all channels, connectors, bolts, concrete anchors and finish trim.

#### 1.5 SYSTEM DESCRIPTION

- A. The "universal grid" system shall be Bidder-engineered to conform to the design shown on Contract Drawings.
- B. The Contractor shall be responsible for structural design and shall design anchorage to building structure.
- C. Design Requirements: Drawings are diagrammatic and are intended to establish basic dimension of units, sight lines, and profiles of units.
  - 1. Manufacturer: Responsible for designing system, including anchorage to structural system and necessary modifications to meet specified requirements and maintain visual design concepts.
  - 2. Employ registered professional engineer, licensed in the State of Washington, to design each component of medical support systems.
  - 3. Attachment Considerations: Account specific site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connection between units and building structure or between components themselves.
  - 4. Make modifications only to meet field conditions and ensure proper fitting of system components.
  - 5. If anchors that act in shear loading are used, size anchors for twice manufacturer's recommended working load.
  - 6. All struts shall be capable of supporting a 825 pound moving load at any point on ceiling without deflection in struts.

## SECTION 05 45 23 HEALTHCARE METAL SUPPORTS

7. Equipment loads are indicated on equipment manufacturer's Installation Drawings.
8. Design suspension system for lateral loading per IBC for essential buildings (hospital).
9. Obtain Architect's approval for connections to building elements at locations other than indicated on Contract Drawings.
10. Obtain Architect's approval of modifications.
11. Support Structure: Locate support members at ceiling plane as indicated on Contract Drawings.
12. Make attachment of equipment support rails possible at any point along support system without drilling or welding into system.
- D. Limit maximum deflection to  $1/720$ th of span in either plane.
- E. Design Loads:
  1. Design support structure to support vertical load, maximum eccentricity of vertical load from support point, transverse force acting on longitudinal rail, longitudinal force acting on longitudinal rail, and deflection criteria established for each piece of supported equipment.
  2. If loads are not defined for each piece of supported equipment, assume concentrated load of 1500 pounds at any point along equipment rails.
  3. Concentrated load is maximum encountered by positioning of equipment at extremities of its travel (maximum load configuration).
  4. Safety Factor: Design support structure for minimum safety factor of three based on ultimate strength under static loading conditions.
- F. Interface With Adjacent Systems: Integrate design and connections with adjacent construction.
  1. Accommodate allowable tolerances and deflections for structural members in installation.
  2. Coordinate with Reflected Ceiling Plan and other Work indicated to be placed in or above ceiling to ensure medical equipment support system does not interfere with or dislocate other Work.

### 1.6 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Submit Shop Drawings of design and erection of grid assembly. Show dimensioned grid.
- C. Submit complete engineering data signed and stamped by Structural Engineer, licensed in State of Washington, verifying ability of all members and connections to support required loads.

### 1.7 PROJECT / SITE CONDITIONS

- A. Review ceiling obstructions and design suspension accordingly.
- B. Install grid system prior to installation of new ductwork and piping.

## PART 2 - PRODUCTS

### 2.1 MEDICAL SUPPORT SYSTEMS MATERIALS

- A. Products of one manufacturer. Approved Manufacturer is Unistrut Corp.  
[www.unistrut.com](http://www.unistrut.com).
  1. Channels: Bidder-designed, as selected from manufacturer's current catalog.
  2. Connectors & Bolts: As indicated in manufacturer's current catalog.
  3. Closure Strip: P1184 PVC snap-in type.

### 2.2 FASTENERS

- A. Screwed Connection Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers:
  1. Size, type and spacing determined to suite Project conditions; ASTM A153, hot-dip galvanized, Class C or D as appropriate.
- B. Anchorage Devices: Powder-driven, concrete inserts, drilled expansion bolts, screws with sleeves.
- C. Welding: In accordance with AWI D1.



## SECTION 05 45 23 HEALTHCARE METAL SUPPORTS

### 3.1 EXAMINATION

- A. Examine conditions just prior to erection and report any conditions that will adversely affect structural design.

### 3.2 INSTALLATION

- A. Install framing system in accordance with approved Shop Drawings and manufacturer's printed instructions.
  - 1. Use laser or equivalent method to level ceiling channels to a maximum vertical deviation of 1/8 inch from a horizontal plane.
  - 2. Ceiling channel spacing is designed for ceiling panels, lights and diffusers. Install channels within tolerance of 1/16th inch in 18 feet length.
  - 3. Paint exposed portions of ceiling channels, end caps and closure strips to match suspended acoustical ceiling grid.
- B. The installed framing system shall be vibration free from normal operation of ceiling-mounted equipment.
- C. Install snap-in closure strips after equipment rails are installed and confirmed to be in working order. Cut to required lengths.

### 3.3 PROTECTION

- A. Protect finished installation under the provisions of Section 01 50 00.

END OF SECTION



## SECTION 05 50 00 METAL FABRICATIONS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Drawings and general provisions of Contract, including General Conditions and Division-1 Specification Sections, apply to Work of this Section.
- B. Provide metal fabrications in accordance with the Contract Documents.
- C. Includes but is not limited to, the following:
  - 1. Miscellaneous steel framing and supports.
  - 2. Shelf angles.
  - 3. Steel weld plates and angles.
  - 4. Miscellaneous steel trim.
  - 5. Metal floor plate and supports.
  - 6. Countertop support brackets.
  - 7. Stainless steel panels in architectural woodwork.
  - 8. Stainless steel wall base.
  - 9. Pipe guardrail at roof, along perimeter of building.

#### 1.2 RELATED SECTIONS

- A. Section 01 33 00 SUBMITTAL PROCEDURES: Submittal procedures.
- B. Section 05 51 00 METAL STAIRS & RAILINGS.
- C. Section 14 21 00 ELECTRIC TRACTION ELEVATORS: Support angles for elevator door sills.

#### 1.3 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. ASTM A36 / A36M, Standard Specification for Carbon Structural Steel.
  - 2. ASTM A53 / A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 3. ASTM A123 / A123M, Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
  - 4. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  - 5. ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 6. ASTM A563, Standard Specification for Carbon and Alloy Steel Nuts.
  - 7. ASTM B633, Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
  - 8. ASTM C1107 / C1107M, Standard Specification for Packaged Dry , Hydraulic Cement Grout (Non-Shrink).
  - 9. ASTM E488, Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements.
  - 10. ASTM F568M, Standard Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners.
- B. American Society of Mechanical Engineers (ASME):
  - 1. ASME B18.6.3, Standard for Machine Screws and Machine Screw Nuts.
  - 2. ASME B18.6.7M, Standard for Metric Machine Screws.
  - 3. ASME B18.21.1, Standard for Lock Washers (Inch Series).
  - 4. ASME B18.21.2M, Standard for Lock Washers (Metric Series).
- C. American Welding Society (AWS):
  - 1. AWS A2.498, Standard Symbols for Welding, Brazing, and Nondestructive Examination.
  - 2. AWS D1.1 / D1.1M, Structural Welding Code - Steel.
  - 3. AWS D1.3, Structural Welding Code - Sheet Steel.
- D. The Master Painters Institute (MPI)
  - 1. MPI No. 79, Primer, Alkyd, Anti-Corrosive for Metal.

- E. The Society for Protective Coatings (SSPC):
  - 1. SSPC Painting Manual-2005, vol. 2, Systems and Specifications.
  - 2. SSPC-SP-3, Standard and Specification for Power Tool Cleaning.
  - 3. SSPC-SP-6 / NACE No. 3, Standard and Specification for Commercial Blast Cleaning.
  - 4. SSPC-Paint-20, Standard and Specification for Zinc-Rich Coating, Type I - Inorganic and Type II - Organic.
  - 5. SSPC-Paint-29, Standard and Specification for Water-Borne Epoxy Primer for Steel Surfaces.

#### 1.4 QUALITY ASSURANCE

- A. Reference Standards: Except as modified by governing Codes and by this Section, comply with the applicable provisions of the following:
  - 1. AWS D1.1.
  - 2. SSPC Painting Manual.
  - 3. ASTM A36 / A36M.
  - 4. ASTM A53 / A53M.
  - 5. ASTM A123 / A123M.
  - 6. MPI No. 79.
- B. Certification of Welders: All welders performing fabrication and erection work shall be currently certified.

#### 1.3 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Shop Drawings: Submit Shop Drawings for fabrication and erection of metal fabrications. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.

### PART 2 - PRODUCTS

#### 2.1 FERROUS METALS

- A. Metal Surfaces, General: For metal fabrications exposed to view upon completion of work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Steel Plates, Shapes and Bars: ASTM A36.
- C. Steel Pipe: ASTM A53, Type S, Grade B, suitable for close coiling; black unless otherwise shown or specified as galvanized.
- D. Steel Tubes: Cold-rolled, ASTM A500.
- E. Structural Bolts, Fasteners: As shown or indicated on Structural and Architectural Drawings.
- F. Sump Grating: Press-locked or welded steel bar grating with 3/4" x 1/8" bars at 13/16 inch on center. Provide steel angle frame.

#### 2.2 MISCELLANEOUS MATERIALS

- A. Non-Shrink Non-Metallic Grout: Factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- B. Fasteners: Provide zinc-coated fasteners complying with ASTM B633, Class Fe / Zn 5 for exterior use. Select fasteners for the type, grade, and class required.
  - 1. Bolts and nuts: Regular hexagon head bolts, ASTM A307, Grade A (ASTM ASME F568M, Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.
  - 2. Machine screws: ASME B18.6.3 (ASME B18.6.7M).
  - 3. Plain washers: Round, carbon steel, ASME B18.22.1 (ASME B18.22M).
  - 4. Lock washers: Helical, spring type, carbon steel, ASME B18.21.1 (ASME B18.21.2M).

5. Expansion anchors: Anchor bolt and sleeve assembly of materials indicated below with capability to sustain, without failure, a load equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E488, conducted by a qualified independent testing agency.
  - a. Material: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe / Zn 5.
- C. Ferrous Metal Primer:
  1. Roof Guardrail: Tnemec "Tneme-Zinc 90.97."
    - a. Universal shop primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI No. 79.
    - b. Zinc-rich primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

### 2.3 FABRICATION, GENERAL

- A. Form metal fabrications from materials of size, thickness and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on Shop Drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B. Form exposed Work true to line and level with accurate angles and surfaces and straight sharp edges. Make exposed joints close fitting, flush and smooth. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing Work.
- C. Make joints as strong and rigid as adjoining sections. Conform to AWS "Structural Welding Code" for welding. Make welds continuous along entire line of contact, except where spot welding is indicated. Grind exposed welds flush and smooth to blend with adjoining surfaces. Where bolted connections are indicated, such connections may be welded, provided the bolted items are not intended to be removable. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- D. Cut, reinforce, drill and tap miscellaneous metal Work as indicated or required to receive hardware, fasteners and similar items.

### 2.4 MISCELLANEOUS FABRICATION

- A. Provide steel framing and supports shown and not specifically mentioned to be provided as part of Work of other trades.
- B. Fabricate steel framing and supports of section and thickness indicated. Provide angles, channels, plates, hangers, brackets, clips, fasteners and other miscellaneous iron and steel items required for complete installation.
- C. Provide anchors, bolts, angles, rolled and bent plates, sleeves, hangers and other miscellaneous items shown or required for attachment of miscellaneous metal fabrications.
- D. Guardrail at Roof:
  1. Provide nominal 1-1/2 inch diameter pipe continuous top rail with nominal 1-1/4 inch diameter pipe vertical supports spaced not to exceed 5 feet.
  2. Guardrail shall be continuous around perimeter of building.
  3. Meet requirements of IBC Section 1013 for guards.
  4. Includes miscellaneous base plates and accessories for complete installation.

### 2.5 FINISHES

- A. Galvanizing: Hot dip galvanize the following items in accordance with ASTM A123 / A 123M.
  1. Pit ladders.
  2. Exterior bollards.
  3. Sump grating and frame.

- B. Prepare surfaces to be painted in accordance with the following:
  - 1. Roof guardrail: SSPC-SP-6.
  - 2. All other: SSPC-SP-3.
- C. Painting: Spray apply specified primers in strict accordance with manufacturer's directions and rate of application.

2.6 STAINLESS STEEL PANELS

- A. Type 304 stainless steel sheets, 0.063 mils (16 gauge) thick with 6-SL finish. Form to size and shapes indicated on Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish embedded items, including concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors that are to be embedded in concrete. Coordinate delivery of such items to Project site.

3.2 INSTALLATION - GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrication to in-place construction; include through bolts, threaded fasteners for concrete and masonry inserts, expansion anchors, and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment and elevation; with edges and surfaces level, plumb, true and free of rack; and measured from established lines and levels.

END OF SECTION

## SECTION 05 51 00 METAL STAIRS & RAILINGS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide bidder-engineered metal stairs and railings per Architect's design and in accordance with Contract Documents.
- B. System Description.
- C. Design Criteria.
- D. Deferred Submittal.
- E. Materials.
- F. Shop priming.
- G. Fabrication.
- H. Installation.
- I. Installation of temporary plywood stair treads in metal pans for Contractor use during execution of the Work.
- J. Installation of precast concrete stair treads and field painting to be delayed until near Date of Substantial Completion.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: for submittal procedures.
- C. Section 01 36 00 - DESIGN-BUILD REQUIREMENTS: for bidder-design requirements.
- D. Section 03 30 00 - CAST-IN-PLACE CONCRETE: for concrete fill for field poured landings.
- E. Section 03 45 00 - ARCHITECTURAL PRECAST CONCRETE: for precast concrete stair treads to be installed under Work of this Section.
- F. Section 06 16 00 - SHEATHING: for temporary plywood sheathing treads.
- G. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: for backing of wall-mounted handrails.
- H. Section 09 91 00 - PAINTING: for finish painting.
- I. STRUCTURAL DRAWINGS: for General Notes additional requirements.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM A36 / A36M, Standard Specification for Carbon Structural Steel.
  - 2. ASTM A53 / A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 3. ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 4. ASTM A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
  - 5. ASTM A653 / A653M, Standard Specification for Sheet Steel, Zinc-Coated (Galvanized), Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 6. ASTM A1011 / A1011M, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- B. American Welding Society (AWS):
  - 1. AWS A2.4, Standard Symbols for Welding, Brazing and Nondestructive Examination.
  - 2. AWS D1.1 / D1.1M, Structural Welding Code - Steel.
- C. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.
- D. The Master Painters Institute (MPI):
  - 1. MPI No. 79, Primer, Alkyd, Anti-Corrosive for Metal.
- E. The Society for Protective Coatings (SSPC):
  - 1. SSPC Painting Manual, 2 volumes.

## SECTION 05 51 00 METAL STAIRS & RAILINGS

### 1.4 SYSTEM DESCRIPTION

- A. Floor landing structural design, including header beam, is shown on Structural Drawings.
- B. Coordinate location of header beam with stair design.
- C. Provide all other structural supports, including intermediate landing framing and the following:
  - 1. Fully welded continuous stringer enclosure around stair well openings.
  - 2. 4-inch high exposed stringer base around intermediate landings.
  - 3. Closed risers and precast concrete treads on metal pan.
  - 4. Concrete-filled intermediate landings.
  - 5. All hangers and attachments shall be concealed in finish Work.
  - 6. Stringers: 12 x 3/8 inch steel plate and 12 inch steel channel as indicated on Drawings.
  - 7. Provide and install temporary plywood treads for Contractor use during execution of the Work. Remove and install permanent concrete treads not less than 8 weeks before the Date of Substantial Completion.
  - 8. 2-1/2-inch pipe top rail, mount at guardrail height.
  - 9. 1-1/4-inch extra strong pipe posts with weld plates, bolted to stringers.
  - 10. 1-1/4-inch standard pipe handrail.
  - 11. Round vertical stainless steel bar pickets. Diameter and spacing as indicated on Drawings. Where not indicated, spaced such that 4-inch diameter sphere cannot pass through.

### 1.5 DESIGN CRITERIA

- A. Design loads in accordance with requirements of the IBC Table 1607.1 and Section 1607.7.
- B. Stairs and Landings: 100 pounds per square foot live load with a concentrated load of 300 pounds per stair tread at 1/240 maximum deflection.
- C. Guardrails:
  - 1. 50 pounds per lineal foot applied in any direction at top of guardrail and to transfer this load through supports to structure.
  - 2. Concentrated Load: 200 pounds applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate building structural elements.
- D. Wall handrails:
  - 1. Concentrated Load: 200 pounds applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate building structural elements.
- E. Seismic Design Loads: As indicated on Structural Drawings, General Notes.

### 1.6 QUALITY ASSURANCE

- A. Structural Performance Requirements: Provide calculations and design Drawings, under the provisions of Section 01 36 00, prepared and stamped by a structural engineer licensed in State of Washington which comply with the design criteria specified under Article 1.5 of this Section.
- B. Codes and Standards: Comply with provisions of following Codes, Specifications and Standards, except as otherwise indicated:
  - 1. AWS A2.4.
  - 2. AWS D1.1.
  - 3. International Building Code.

### 1.7 DEFERRED SUBMITTAL (See Section 01 42 00: Definitions)

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Submit Shop Drawings for fabrication and erection. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
  - 1. Provide stamped structural calculations to indicate compliance with Code and Project requirements.



## PART 2 - PRODUCTS

## 2.1 FERROUS METALS

- A. Metal Surfaces, General: For metal exposed to view upon completion of Work, provide materials selected for their surface flatness, smoothness and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference Standards for stretcher-leveled sheet.
- B. Steel Plates, Shapes and Bars: ASTM A36.
- C. Steel Sheets: ASTM A1011, Grade 30, minimum 14 gauge.
- D. Steel Pipe: ASTM A53, Type S, Grade B, suitable for close coiling; black unless otherwise shown or specified as galvanized.
- E. Steel Tubes: Cold-rolled: ASTM A500; hot-rolled ASTM A501.
- F. Light Gauge Formed Steel: ASTM A653, Grade A minimum.
- G. Hanger Rods: ASTM A36 Grade threaded steel rods, diameter as shown.
- H. Shop Primer: Fast-curing, lead and chromate free, universal modified-alkyd primer complying with MPI No. 79.

## 2.2 METAL-FRAMED STAIRS

- A. General: Construct stairs to conform to sizes and arrangements indicated on Drawings. Provide complete stair assemblies, including metal framing, hangers, clips, brackets, metal stair and landing pans, and other components necessary for the support of stairs and platforms, and as required to anchor and contain the stairs on the supporting structure.
- B. Stair Framing: Fabricate stringers of structural steel channels, or plates, or a combination thereof, as indicated on Drawings.
  - 1. Provide closures for exposed ends of stringers. Construct platforms of structural steel channel headers, steel sheet and miscellaneous framing members as indicated on Drawings.
  - 2. Bolt or weld headers to stringers, and framing members to stringers and headers; fabricate and join so that bolts, if used, do not appear on finish surfaces.
  - 3. Detail wall side stringers to terminate at 4 inch height above landings.
  - 4. Detail stringers to clear furred walls allowing approximately 1/4 inch clearance for installation of gypsum boards.
- C. Metal Pan Risers, Subtreads and Subplatforms: Shape metal pans for risers and subtreads to conform to configuration shown.
  - 1. Provide thicknesses of steel sheet for metal pans indicated, but not less than that required to support total design loading.
  - 2. Fabricate risers of minimum 14 gauge hot-rolled steel sheet. Provide radius nosings on risers.
  - 3. Fabricate stair and platform pans of cold or hot rolled steel sheet, gauges as shown. If not shown, provide 14 gauge minimum stair treads, and 12 gauge landings.
- D. Attach risers and subtreads to stringers by means of brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting or bolting.

## 2.3 FABRICATION, GENERAL

- A. Fit and shop assemble in largest practical sections for delivery to Site.
- B. Fabricate components with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface.
- D. Make exposed joints butt tight, flush and hairline.
- E. Ease exposed edges to small uniform radius.
- F. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.
- G. Supply components required for anchorage of fabrications.
- H. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## SECTION 05 51 00 METAL STAIRS & RAILINGS

- I. Accurately form components required for anchorage of stairs, landings and railings to each other and to building structure.
- 2.4 FABRICATION - STAIRS & LANDINGS
  - A. Fabricate stairs and landings with closed risers and factory finished treads.
  - B. Form landings with sheet steel or metal deck. Reinforce as required to attain design load requirements.
  - C. Prime paint exposed components.
- 2.5 RAILINGS
  - A. Provide steel railings, flush welded and sleeved joint construction, completed with sleeves, brackets, bolts and fastening devices required for complete installation.
  - B. Make handrails continuous for full length of each flight of stairs with no protrusions, attachments, hardware or openings capable of catching loose clothing. Return ends of handrails to the wall terminating 1/4 inch from finish wall surface.
    - 1. Extend wall handrails at each stair run per IBC Section 1012.5 and as indicated on Drawings.
  - C. Place handrails 34 inches above the upper surface of the tread, measured vertically to the top of the rail from a point on the tread at the face of the riser.
  - D. Provide a clearance of 1-1/2 inches between handrail and wall to which fastened. Provide malleable iron brackets and bolt to backing in wall.
  - E. Form simple and compound curves of handrails by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of handrail pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of handrail pipe.
  - F. Provide guardrails at top landings as indicated on Drawings.
- 2.6 FINISHES
  - A. Prepare surfaces to be primed in accordance with SSPC SP3.
  - B. Clean surfaces of rust, scale, grease and foreign matter prior to finishing.
  - C. Do not prime surfaces in direct contact with concrete or where field welding is required.
  - D. Prime paint items with one coat.

## PART 3 - EXECUTION

- 3.1 EXAMINATION
  - A. Measure existing stairs and verify that field conditions are acceptable and are ready to receive Work.
  - B. Beginning of installation means erector accepts existing conditions.
- 3.2 PREPARATION
  - A. Clean and strip steel to bare metal where site welding is required.
  - B. Supply items required to be cast into concrete with setting templates to appropriate sections.
- 3.3 INSTALLATION
  - A. Install items plumb and level, accurately fitted, free from distortion or defects.
  - B. Provide anchors, plates, angles, hangers and struts required for connecting stairs to structure and to existing.
  - C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
  - D. Field weld components indicated on approved Shop Drawings. Perform field welding in accordance with AWS D1.1.
  - E. Field bolt and weld to match shop bolting and welding. Conceal bolts and screws except as shown.
  - F. Mechanically fasten joints butted tight, flush and hairline. Grind weld smooth and flush.

## SECTION 05 51 00 METAL STAIRS & RAILINGS

- G. Secure handrails to walls with malleable iron wall brackets. Locate brackets as indicated on Drawings, or if not indicated, at spacing required to support structural loads. Secure wall brackets and wall return fittings to building construction as follows:
  - 1. Use type of bracket with pre-drilled hole for exposed bolt anchorage.
  - 2. For concrete anchorage, use drilled-in expansion shield and exposed machine bolt.
  - 3. For steel framed gypsum board assemblies, fasten brackets directly to steel backing or concealed anchors. Drill and tap backing and fasten brackets with machine bolts.
- H. After erection, prime welds, abrasions and surfaces not shop primed except surfaces to be in contact with concrete.
- I. Install temporary plywood treads for Contractor use during execution of the Work.
- J. Not less than 8 weeks prior to the Date of Substantial Completion, remove temporary plywood treads and install precast concrete treads.
- K. Prior to installation of precast concrete treads, apply finish coat of paint to steel stairs under the provisions of Section 09 91 00.

### 3.4 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset from True Alignment: 1/4 inch.

END OF SECTION



## SECTION 06 10 53 MISCELLANEOUS ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide miscellaneous rough carpentry in accordance with the Contract Documents.
- B. Concealed wood blocking and nailers.
- C. Wood backing.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Substitute wood backing for metal backing.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM A153 / A153M-05, Standard Specification for Zinc-Coating (Hot-Dip) on Iron and Steel Hardware.
- B. American Wood Preservers' Association (AWPA):
  - 1. AWPA C18-03, Standard for Pressure Treated Material in Marine Construction.
  - 2. AWPA C20-02, Structural Lumber - Fire-Retardant Treatment by Pressure Processes.
  - 3. AWPA C27-02, Plywood - Fire-Retardant Treatment by Pressure Processes.
  - 4. AWPA PS1-95, U.S. Product Standard for Construction and Industrial Plywood.

#### 1.4 QUALITY ASSURANCE

- A. Reference Standards: Except as modified by governing Codes and by this requirements of this Section, comply with applicable provisions of the following:
  - 1. ASTM A 153 / A 153M.
  - 2. AWPA C18.
  - 3. AWPA C20.
  - 4. AWPA C27.
  - 5. AWPA PS1.

#### 1.5 PROJECT CONDITIONS

- A. Coordination: Fit carpentry Work to other Work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other Work.
- B. Contractor's Option: Fire retardant wood blocking may be provided in lieu of metal backing in gypsum board partitions. See Section 09 22 16.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Blocking, Nailers: "Standard or better" grade lumber, S4S, unless otherwise indicated.

#### 2.2 PRESERVATIVE WOOD TREATMENT BY PRESSURE PROCESS:

- A. Preservative Treatment: Where lumber is indicated as "Pressure Treated" (PT), or is specified herein to be treated, comply with applicable requirements of AWPA C18. Do not use inorganic boron (SBX) preservative treated wood.
  - 1. Pressure-treat items with water-borne preservative that corresponds with corrosion resistance of fasteners and anchorages. After treatment, kiln-dry lumber to a maximum moisture content of 19 percent. Treat indicated items and the following:
    - a. Wood nailers, curbs, blocking, stripping and similar members in connection with roofing, flashing and concrete, and generally not located inside the building.

2.3 FIRE RETARDANT TREATMENT BY PRESSURE PROCESS

- A. General: Where fire retardant treated (FR) wood is indicated, pressure impregnate lumber and plywood with fire retardant chemicals to comply with AWPAC20 and APWA C27, respectively, for treatment type indicated; identify "fire retardant treated wood" with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection, Inc. or other testing and inspection agency acceptable to authorities having jurisdiction.
  - 1. Use interior Type A fire retardant wood for blocking in partitions inside building.

2.4 MISCELLANEOUS MATERIALS

- A. Fasteners and Anchorages: Provide size, type, material as indicated and/or required.
- B. Provide G60 hot dip galvanized bolts and expansion type anchors for attachment of chromated copper arsenate (CCA-C) preservative pressure-treated wood to concrete or masonry.
- C. Provide G185 hot dip galvanized (ZMAX™) or stainless steel bolts and expansion type anchors for attachment of other than CCA-C preservative pressure-treated wood to concrete or masonry.
- D. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, not less than 3/4 inch nominal thickness.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry Work to required levels and lines, with members plumb and true to line and cut and fitted.
- B. Securely attach carpentry Work to substrate by anchoring and fastening as shown and as required to recognized Standards. On parapets, use blocking lumber in longest practical lengths.
- C. Install fire-retardant wood as blocking in partitions. Provide 2" x 6" fire-retardant blocking attached to metal studs at locations indicated for metal backing.

END OF SECTION

## SECTION 06 16 00 SHEATHING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Plywood wall sheathing.
- B. Glas-mat gypsum sheathing.
- C. Plywood backing panels for equipment.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of Product Data, Samples, and Certificates.
- C. Section 05 31 00 - METAL DECKING: for steel roof decking substrate to receive glas-mat gypsum sheathing as substrate for roof insulation.
- D. Structural Drawings, General Notes: for additional requirements.

#### 1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C1002, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - 2. ASTM C1177 / C1177M, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - 3. ASTM C1280, Standard Specification for Application of Gypsum Sheathing.
  - 4. ASTM C1396 / C1396M, Standard Specification for Gypsum Board.
- B. American Wood Preservers' Association (AWPA):
  - 1. AWPA U1, use category system: User Specification for Treated Wood.

#### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit copies of manufacturer's Specifications, installation instructions and standard Details. Include only specific details that will be used on Project or highlight details in manufacturer's catalog.

### PART 2 - PRODUCTS

#### 2.1 PLYWOOD SHEATHING

- A. Industry Standard: APA, Construction and Industrial Softwood Plywood, United States Plywood Standard/ANSI A 199.1, PS 1.
- B. Plywood Grade: C-D Interior.
- C. Panel Edges: Square.
- D.. Wall Sheathing: As indicated on Drawings.

#### 2.2 GLAS-MAT GYPSUM SHEATHING

- A. Acceptable Product and Manufacturer: ASTM C1177, Dens-Glass Gold Fireguard by Georgia Pacific, [www.gp.com](http://www.gp.com).
- B. Face Sheets: Water-resistant fiberglass.
- C. Core: Water-resistant and fire-rated gypsum core.
- D. Size: 5/8 inch thick, 4 feet wide sheets square edged.

#### 2.3 PLYWOOD BACKING PANELS FOR EQUIPMENT

- A. APA Grade: C-D PLUGGED INT with exterior glue.
- B. Thickness: not less than 3/4-inch.

#### 2.4 ACCESSORIES

- A. Fasteners:
  - 1. Screws: Bugle head screws, Type S, in size recommended by sheathing manufacturer for thickness of sheathing and type of framing.
- B. Construction Adhesive:

## SECTION 06 16 00 SHEATHING

1. Industry Standard: APA Specification, AFG-01, exterior waterproof.
  2. Acceptable Adhesives: 4000 Sub-Floor and Plywood Adhesive by DAP, Inc., SFA-66 Sub-Floor and Construction Adhesive by Miracle Adhesives, and PL400 by ChemRex, Inc.
- C. Screws for Glas-Mat Gypsum Sheathing: ASTM C1002, corrosion-resistant treated.

### 2.5 FACTORY WOOD

- A. Treated plywood: Comply with requirements of AWP-U1 - use category system for wood treatments determined by use categories, expected service conditions, and specific applications.
1. Preservative-Treated Wood: Provide plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWP standards.
- B. Preservative Pressure Treatment of Plywood Above Grade: AWP Use Category UCZ and UC3B, Commodity Specification F (Treatment C9) using waterborne preservative to 0.25 lb/cu. ft. retention.
1. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
- C. Precut wood panels prior to treatment, where possible.
- D. Treat wood panels in contact with roofing, flashing, or waterproofing.
- E. Treat wood panels in contact with concrete and masonry.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General:
1. Nail or screw heads shall be flush with, but not penetrate, sheathing surface.
  2. Use of Simpson edge clips to provide spacing between sheathing panels is acceptable.
- B. Glas-Mat Gypsum Sheathing:
1. Install in accordance with ASTM C1280 and manufacturer's written recommendations.

END OF SECTION



## SECTION 06 40 00 ARCHITECTURAL WOODWORK

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Architectural woodwork in accordance with the Contract Documents.
- B. Includes but is not limited to the following:
  - 1. Wood paneling.
  - 2. Nurses stations and reception desks.
  - 3. Standing and running trim.
  - 4. Wood chair rail.
  - 5. Display casework.
  - 6. Miscellaneous items where shown.
  - 7. Aluminum medical equipment mounting channels and pivot mounts.
- C. Work of this Section is affected by vendor-provided aquariums which are bidder-designed.
  - 1. Architectural woodwork to receive aquariums is located as follows:
    - a. Room 1113, Waiting.
    - b. Room 2001, Vestibule.
    - c. Room 2003, Wait.
    - d. Room 4000, Wait.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 05 50 00 - METAL FABRICATIONS: Steel countertop support brackets.
- D. Section 06 44 00 - ORNAMENTAL WOODWORK: Ornamental wood paneling applied to architectural woodwork.
- E. Section 06 61 16 - SOLID SURFACING FABRICATIONS: Solid surfacing.
- F. Section 08 80 00 - GLAZING: glass doors and shelving to be installed in architectural woodwork.
- G. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.
- H. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Concealed backing.
- I. Section 10 11 16 - MARKERBOARDS: Markerboard skins to be installed in architectural woodwork.
- J. Section 12 32 16 - PLASTIC LAMINATE-CLAD CASEWORK: Hardware.
- K. Section 13 13 00 - AQUARIUMS: for aquariums to be installed in Work of this Section.

#### 1.3 REFERENCES

- A. Architectural Woodwork Institute (AWI):
  - 1. Architectural Woodwork Quality Standards, 8th Edition, Version 1.0.

#### 1.4 QUALITY ASSURANCE

- A. Reference Standards: Architectural Woodwork Quality Standards by AWI.  
AWI references herein apply to this Standard.

#### 1.5 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Hardwood Samples: 8-1/2 x 11 inches. Submit the following samples in duplicate for approval:
  - 1. Wood panel/veneer with specified finish, 8-1/2 x 11 inches.
  - 2. Hardwood with specified finish: 18 x 11 inches.
- C. Shop Drawings: Submit large scale plans, elevations and details of all assembled architectural woodwork. Include rough-in provisions of Work of other trades where applicable. Include all necessary finishing information including product data, with Shop Drawing Submittal.
  - 1. Contractor shall submit simultaneously with Shop Drawings for Work of Section 13 13 00.
- D. Product Data: Provide hardware catalog cuts on all hardware Substitutions for approval.

#### 1.6 PRODUCT HANDLING

## SECTION 06 40 00 ARCHITECTURAL WOODWORK

- A. Protect woodwork during transit, delivery, storage and handling to prevent wetting, damage, soiling and deterioration.
- B. Do not deliver woodwork, until painting, wet work, sanding and grinding, and similar operations which could have detrimental effects on woodwork, have been completed in installation areas.

### 1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain the optimum indoor relative humidity between 25 and 55 percent in spaces where Work is to be installed.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Except as otherwise indicated, comply with following requirements for architectural woodwork not specifically indicated as prefabricated or prefinished standardized products.
- B. Wood Moisture Content: Provide kiln-dried lumber with an average moisture content of 6 percent to 10 percent.
  - 1. Fire retardant lumber: As specified in Section 06 10 53. Provide as backing for running trim.
  - 2. Preservative treated lumber: As specified in Section 06 10 53. Provide for plates in contact with concrete.
- C. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by AWI 100 or to actual sizes and patterns as shown, unless otherwise indicated.
- D. Interior Wood for Transparent Finish, Except as Otherwise Indicated:
  - 1. Solid wood: As scheduled in Section 09 06 10, AWI Grade I per 100-T-4 and 100-T-5.
  - 2. Veneer: As scheduled in Section 09 06 10, AWI Grade A per 200-T-9.
- E. Board Materials:
  - 1. Particle board: 45 pcf density, "Industrial Grade."
  - 2. Panel backing: MDF particle board.
  - 3. Flame-retardant panel backing: Class 1 Flame-retardant MDF particle board when tested per UL 723.

### 2.2 HARDWARE

- A. Provide casework hardware as specified in Section 12 32 16, unless otherwise noted.
- B. For Display Casework:
  - 1. Glass Door Pivot Hinges.
  - 2. Glass Door Lock and Strike for Hinged Door: Häfele Model 209.99.044.
  - 3. Metal Shelf Supports: Häfele Model 282.38.708. Quantity: For three shelves per cabinet.
  - 4. Recessed-Mounted Halogen Lamp: Häfele Model 823.94.210.
- C. Aluminum Medical Equipment Mounting Channels:
  - 1. Vertical surface-mounted channels.
  - 2. Length: As indicated on Drawings.
  - 3. Finish: Clear anodized satin.
  - 4. Basis of Design: Series WC-0002 Standard channels by GCX Corp., [www.gcx.com](http://www.gcx.com). Approved Substitutions.
- D. Flush Pivot Mounts:
  - 1. Provide by same manufacturer as aluminum medical equipment mounting channels.
  - 2. Swivel and 120 degrees tilt adjustments.
  - 3. Duty Rating: 30 pounds.
  - 4. Basis of Design: M-Series by GCX Corp., [www.gcx.com](http://www.gcx.com). Approved Substitutions.

### 2.3 FABRICATION, GENERAL

## SECTION 06 40 00 ARCHITECTURAL WOODWORK

- A. Quality Standards: Comply with design and construction features for architectural woodwork as shown. Where not shown, provide architectural woodwork in accordance with the following AWI Standards as applicable:
    - 1. Standing and running trim: Section 300, custom grade.
    - 2. Casework and countertops: Section 400, flush overlay design, custom grade.
    - 3. Paneling: Section 500, custom grade.
    - 4. Finishing: Section 1500.
  - B. Fabricate standing and running trim to dimensions, profiles and details shown. Rout or groove reverse side (backed-out) of trim members to be applied to flat surface, except for members with ends exposed in finish Work.
  - C. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain measurements and verify dimensions and Shop Drawing details as required for accurate fit.
  - D. Wood Panels: Fabricate with 1/2 inch MDF backing. Paint butt edges flat black.
  - E. Molded Work: Cope at returns and internal angles and miter at external corners.
- 2.4 SHOP-APPLIED FINISHES
- A. Finish all shop-fabricated natural woodwork under this Section with custom grade conversion varnish, satin finish. Fill open grade wood subject to hand contact. Stain wood to match factory-finished doors.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Install concealed backing attached to metal studs for running trim.
- B. Prior to installation verify that environmental conditions are met.

### 3.2 INSTALLATION

- A. General: Comply with AWI Section 1700, custom grade except as otherwise indicated.
- B. Coordinate Work with that of other trades affected by this installation. Unless otherwise shown, provide supports and attachments to be incorporated into or added to Work.
- C. Provide a competent and experienced superintendent to supervise, coordinate and expedite the installation.
- D. Scribe and cut Work to fit adjoining Work and refinish cut surfaces or repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built-in or directly attached to substrates.
- F. Install paneling to walls with construction or panel adhesive. Provide 1/16 inch joints between panels and between panels and adjoining materials.
- G. Install standing and running trim with minimum number of joints possible, using full length pieces to the greatest extent possible. Hand select pieces of wood for natural finish to minimize variation of grain between adjacent pieces. Provide 45 degree hairline joints. Attach wood trim with adhesive and electric nails. Touch-up all nail holes with matching color putty.
- H. Install Work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8 inch in 8 feet for plumb and level.
- I. Repair any damaged woodwork or finish prior to Substantial Completion. Eliminate all functional and visual defects.

END OF SECTION



## SECTION 06 44 00 ORNAMENTAL WOODWORK

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide ornamental woodwork in accordance with the Contract Documents.
- B. Prefabricated ornamental wood paneling.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 06 40 00 - ARCHITECTURAL WOODWORK: Architectural woodwork to receive ornamental wood paneling and installation.

#### 1.3 REFERENCES

- A. Architectural Woodwork Institute (AWI):
  - 1. Architectural Woodwork Quality Standards, 8th Edition, Version 1.0.

#### 1.4 QUALITY ASSURANCE

- A. Reference Standards: Architectural Woodwork Quality Standards by AWI.  
AWI references herein apply to this Standard.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Samples: Submit two 8-1/2 x 11 inch samples of each product with specified finish for approval.
- C. Shop Drawings: Submit large scale plans, elevations and details of all assembled architectural woodwork. Include rough-in provisions of Work of other trades where applicable. Include all necessary finishing information including product data, with Shop Drawing Submittal.

#### 1.6 PRODUCT HANDLING

- A. Protect woodwork during transit, delivery, storage and handling to prevent wetting, damage, soiling and deterioration.
- B. Do not deliver woodwork, until painting, wet work, sanding and grinding, and similar operations which could have detrimental effects on woodwork, have been completed in installation areas.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain the optimum indoor relative humidity between 25 and 55 per cent in spaces where Work is to be installed.

### PART 2 - PRODUCTS

#### 2.1 ORNAMENTAL WOOD PANELS

- A. Approved Manufacturer: Interlam, Inc. [www.interlam-design.com](http://www.interlam-design.com)
- B. Patterns:
  - 1. COP 001 unless otherwise noted.
  - 2. Pattern Orientation: Vertical orientation for installation with pattern oriented vertically.
- C. Repeat Type:
  - 1. Continuous flow pattern unless otherwise noted.
- D. Core Material: Medite - FR2.
- E. Panel Thickness:
  - 1. Nominal 3/4 inch unless otherwise noted.
- F. Panel Size: 4 x 8 feet for cutting to custom sizes.

#### 2.2 FABRICATION, GENERAL

- A. Quality Standards: Comply with design and construction features for architectural woodwork as shown. Where not shown, provide architectural woodwork in accordance with the following AWI Standards as applicable:

## SECTION 06 44 00 ORNAMENTAL WOODWORK

1. Paneling: Section 500, custom grade.
  4. Finishing: Section 1500.
  - B. Measurements: Before proceeding with fabrication of ornamental woodwork required to be fitted to other construction, obtain measurements and verify dimensions and Shop Drawing details as required for accurate fit.
- 2.3 SHOP-APPLIED FINISHES
- A. Finish all shop-fabricated ornamental woodwork under this Section with 2 coats custom grade lacquer, semi-gloss finish. Fill open grade wood subject to hand contact.
- 2.4 ADHESIVE
- A. As recommended by ornamental woodwork manufacturer for adhering directly to architectural woodwork substrate. Product shall be compatible with substrate.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Section 06 40 00 for installation.

END OF SECTION

## SECTION 06 60 00 PLASTIC FABRICATIONS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide resin panels in accordance with the Contract Documents for installation under other Sections.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: for submittal procedures.
- C. Section 01 78 23 – OPERATION & MAINTENANCE DATA: for maintenance data to be included in Operation & Maintenance Manuals.
- D. Section 09 06 10 – INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: for selected patterns and colors.

#### 1.3 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Show fabrication details and connection to adjacent Work.
- C. Product Samples: For verification purposes, submit two 12 x 12 inches product samples of each color, pattern, and finish scheduled for use on this Project.
- D. Quality Control Submittals: Prior to fabrication, submit certified statement by resin panel manufacturer that fabricator and installer are approved by resin panel manufacturer.
- E. Closeout Submittals: Submit under the provisions of Section 01 78 23 maintenance data for each installed product.

#### 1.4 PROJECT / SITE CONDITIONS

- A. Do not install Work of this Section until walls and ceilings of the spaces to receive the Work have been finished.

### PART 2 - PRODUCTS

#### 2.1 RESIN PANELS

- A. Translucent transaction surfaces: Subject to requirements, provide resin panels by Lightblocks, [www.lightblocks.com](http://www.lightblocks.com).
  - 1. Style and Pattern: As scheduled in Section 09 06 10.
  - 2. Size: as indicated on Drawings.
- B. Decorative panels: Subject to requirements, provide resin panels by Lumicor, [www.lumicor.com](http://www.lumicor.com).

#### 2.2 ACCESSORIES

- A. Stand Offs: Provide by same manufacturer as resin panels. Manufacturer's standard.
  - 1. Size: As indicated on Drawings.

#### 2.3 FABRICATION

- A. Shop fabricate components to greatest extent possible to sizes and shapes indicated on approved Shop Drawings.
- B. Provide shop cutouts for fittings and accessories as indicated on approved Shop Drawings.
- C. Cut and finish component edges with clean, sharp returns.
  - 1. Rout radii and contours to template.
  - 2. Repair or replace defective and inaccurate panels.
- D. Fabrication Tolerances: Plus or minus 1/16-inch overall.

### PART 3 - EXECUTION

#### 3.1 CLEANING & PROTECTION

- A. After installation, clean exposed surfaces to remove dirt, adhesive, sealant, and other blemishes in accordance with resin panel manufacturer's written instructions.
- B. After cleaning, apply heavy kraft paper or other protective coating masked in place to protect surface damage until date of Substantial Completion.

SECTION 06 60 00 PLASTIC FABRICATIONS

END OF SECTION



## SECTION 06 61 16 SOLID SURFACING FABRICATIONS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Work includes but is not limited to the following:
  - 1. Countertops with integral bowls and non-integral backsplashes at Patient Rooms.
  - 2. Countertops with rim-mount kitchen sinks and non-integral backsplashes at Staff Lounges.
  - 3. Lavatory tops with integral lavatory and non-integral backsplashes at all public toilets.

#### 1.2 RELATED SECTIONS

- A. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- B. Section 01 77 00 - CLOSEOUT PROCEDURES: Manufacturer's warranty.
- C. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's care and maintenance data.
- D. Section 01 79 00 - DEMONSTRATION & TRAINING: Review maintenance procedures.
- E. Section 05 50 00 - METAL FABRICATIONS: Metal supports.
- F. Section 06 40 00 - ARCHITECTURAL WOODWORK: Wood substrates.
- G. Section 09 06 10 - ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Color selections.
- H. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Concealed blocking.
- I. Section 12 32 16 - PLASTIC LAMINATE-CLAD CASEWORK: Substrates.
- J. Division 22 - PLUMBING: Plumbing connections.

#### 1.3 REFERENCES

- A. DuPont Corian Technical Bulletin CTDC-123, Finishing Corian Surfaces.
- B. DuPont Corian Technical Bulletin CTDC-128, Installing a One-Piece Vanity Top & Bowl.

#### 1.4 QUALITY ASSURANCE

- A. Fabricator: Licensed by manufacturer as a certified fabrication / installation source.

#### 1.5 DEFINITIONS

- A. Solid surface: Nonporous, homogenous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

#### 1.6 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent Work.
- C. Samples: Submit minimum 6 x 6 inch samples in duplicate for color verification. Approved samples will be retained as standards for Work.
- D. Product Data: Indicate product description, fabrication information and compliance with requirements of the Contract Documents.
- E. Submit copy of fabricator/installer certification number from manufacturer.
- F. Maintenance Data: Submit under the provisions of Section 01 78 23 manufacturer's care and maintenance data, including repair and cleaning instructions.
  - 1. Submit manufacturer's maintenance kit for finishes.

#### 1.7 DELIVERY, STORAGE & HANDLING

- A. Do not deliver components to Project Site until areas are ready for installation. Store components indoors prior to installation.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of Project.

#### 1.8 WARRANTY

- A. Submit under the provisions of Section 01 77 00 manufacturer's 10 year warranty against material defects.
  - 1. Warranty shall provide material and labor to repair or replace defective materials.

## SECTION 06 61 16 SOLID SURFACING FABRICATIONS

2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted by manufacturer.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Solid Surfacing: DuPont Corian, except as specified herein, colors as scheduled in Section 09 06 10.
- B. Sealant: Matching color "Silicon Sealant for DuPont Corian."
- C. Sinks: P1A and P2A: 820S. Selected color: As scheduled.

#### 2.2 FABRICATIONS

- A. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and manufacturer's Technical Bulletin: CTDC-117.
- B. Form joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 2 inch wide reinforcing strip of Corian under each joint.
- C. Provide holes and cutouts for plumbing and bath accessories as indicated on the Drawings.
- D. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts; then sand all edges smooth. Repair or reject defective or inaccurate Work.
- E. Lavatory Tops with Seamed Bowls: 1/2 inch thick countertop of Corian, having edge details as shown on Drawings, complete with seamed under-mount mount bowl. Provide countertops complete with backsplashes of size shown on Drawings.
- F. Finish: All surfaces shall have uniform finish. Manufacturer's Technical Bulletins: CTDC-100, 123, and 132.
  1. Matte, with a gloss rating of 5 to 20.
- G. Backsplashes: Fabricate of 1/2 inch Corian for installation with silicone sealant. Color to match adjacent countertop.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved Shop Drawings and manufacturer's product data and installation details.
- B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished Work.
- C. Exposed joints/seams shall not be allowed.
- D. Reinforce field joints with solid surface strips extending not less than 1 inch on either side of seam with strip being same thickness as top.
- E. Cut and finish component edges with clean, sharp returns.
- F. Rout radii and contours to template.
- G. Anchor securely to base cabinets or other supports.
- H. Align adjacent countertops and form seams to comply with manufacturer's printed recommendations using adhesive in color to match countertop.
- I. Carefully dress joints smooth, remove surface scratches and clean entire surface.
- J. Provide backsplashes as indicated on Drawings. Adhere to walls and countertops using manufacturer's standard color-matched silicone sealant.
- L. Install countertops with no more than 1/8-inch sag, bow or other variation from a straight line.

## SECTION 06 61 16 SOLID SURFACING FABRICATIONS

### 3.3 REPAIR

- A. Repair or replace damaged Work which cannot be repaired to Architect's satisfaction.

### 3.4 CLEANING & PROTECTION

- A. Keep components clean during installation.
- B. Remove adhesives, sealants and other stains.
- C. Protect surfaces from damage until Final Acceptance.
- D. Installer shall provide under the provisions of Section 01 79 00 the Corian Commercial Care and Maintenance video, review maintenance procedures with Owner's head of maintenance upon Project completion.

END OF SECTION



## SECTION 06 61 19 QUARTZ SURFACING FABRICATIONS

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Reception desk countertops and transaction counters.
- B. Lavatory countertops.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions, and Division 01 apply to Work of this Section.
- B. Section 01 25 13 – PRODUCT SUBSTITUTION PROCEDURES.
- C. Section 01 33 00 – SUBMITTAL PROCEDURES.
- B. Section 09 06 10 – INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: for selected patterns and colors.

#### 1.3 REFERENCES

- A. International Organization for Standardization (ISO):
  - 1. ISO 9002, Quality Systems; Model for Quality Assurance in Production, Installation, and Servicing.
  - 2. ISO 14001, Environmental Management Systems.
  - 3. NSF.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Be ISO 9002 and ISO 14001 certified.
- B. Installer Qualifications: Firm shall have five years experience installing architectural stone and certified Installer by quartz surfacing manufacturer.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data:
  - 1. Quartz Surfacing
    - a. Submit manufacturer's product data
    - b. Sample warranty form
    - c. Fabrication and installation instructions.
  - 2. Accessories: Manufacturer's product data and installation instructions.
- C. Shop Drawings: Show field-verified dimensions, quartz surfacing dimensions, locations and dimensions of cutouts, required locations of support and blocking members, edge profiles, and installation details and methods. Identify color(s) and finish(es).
- D. Samples: For verification purposes, submit two 10 x 10 inches samples of each color and finish selected.
  - 1. Stone Adhesive: Submit two samples of an adhesive joint for each color quartz surfacing selected. Show color match of adhesive.
- E. Fabricator Qualifications: Submit evidence of fabricator's qualifications.
- F. Closeout Submittals: Submit under the provisions of Section 01 77 00.
  - 1. Submit completed warranty form.

#### 1.6 DELIVERY, STORAGE & HANDLING

- A. Packaging, Shipping, Handling, & Unloading: Observe manufacturer's recommendations and handle in manner to prevent breakage or damage.
- B. Brace parts if necessary.
- C. Transport in near-vertical position with finished face toward finished face.
- D. Do not allow finished surfaces to rub during shipping or handling.
- E. Store in racks in near-vertical position.
- F. Prevent warpage and breakage.
- G. Store inside away from direct exposure to sun.
- H. Store between 25 and 130 deg F.
- I. Store with finished face toward finished face.

#### 1.7 WARRANTY

## SECTION 06 61 19 QUARTZ SURFACING FABRICATIONS

- A. Provide manufacturer's 10-year limited warranty against product defects when fabricated and installed by a CaesarStone certified fabricator.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Provide CaesarStone Quartz Surfacing [www.caesarstoneus.com](http://www.caesarstoneus.com).
- B. Substitutions: Zodiaq manufactured by DuPont may be substituted in accordance with Section 01 25 13.

#### 2.2 QUARTZ SURFACING

- A. Composition: 93 percent crushed quartz aggregate combined with resins and pigments and fabricated into slabs using a vacuum vibro-compaction process.
- B. Thickness: Nominal: As shown on Drawings.
- C. Size: Slabs shall not be less than 56.5 x 120 inches to minimize number of joints in installation.
- D. Identification: Material shall be labeled with batch number and imprinted on back with manufacturer's identifying mark.
- E. Color: Provide color(s) as scheduled in Section 09 06 10.
- F. Finish
  - 1. Polished Surface shall have gloss greater than or equal to 35 percent at 50 deg F.
  - 2. Honed Surface shall have a matte finish.
- G. Exposed Edges & Outside Corners: As indicated on Drawings.

#### 2.3 ACCESSORIES

- A. Mounting Adhesives: Provide structural-grade silicone or epoxy adhesives of type recommended by manufacturer for application and conditions of use.
  - 1. Acceptable Silicone Manufacturers:
    - a. Dow Corning.
    - b. GE Sealants and Adhesives.
  - 2. Acceptable Epoxy Manufacturers:
    - a. Akemi North America.
    - b. Bonstone Material Corporation.
    - c. Tenax USA.
- B. Provide spacers, if required, of type recommended by adhesive manufacturer.
- C. Stone Adhesive: Provide epoxy or polyester adhesive of type recommended by manufacturer for application and conditions of use.
  - 1. Acceptable Manufacturers:
    - a. Akemi North America.
    - b. Bonstone Material Corporation.
    - c. Tenax USA.
  - 2. Color: Adhesive which will be visible in finished work shall be tinted to match quartz surfacing.
- D. Fasteners, Grout & Hardware: As recommended by quartz surfacing manufacturer.
- E. Joint Sealants: Clear silicone sealant of type recommended by manufacturer for application and conditions of use. Provide anti-bacterial type in toilet rooms.
  - 1. Acceptable Manufacturers:
    - a. Dow Corning.
    - b. GE Sealants and Adhesives.
- E. Solvent: Product recommended by adhesive manufacturer to clean surface of quartz surfacing to assure adhesion of adhesives and sealants.
- F. Cleaning Agents: Non-abrasive, soft-scrub type kitchen cleansers.

#### 2.4 FABRICATION

- A. Fabricator: Firm shall have five years experience fabricating architectural stone and shall have water-cooled cutting tools.

## SECTION 06 61 19 QUARTZ SURFACING FABRICATIONS

- B. Shop Assembly: Observe proper safety procedures and comply with manufacturer's instructions.
- C. Layout: Layout joints to minimize joints and to avoid L-shaped pieces of quartz surfacing.
- D. Inspect Material:
  - 1. Inspect material for defects prior to fabrication.
  - 2. Color Match: Materials throughout Project shall be from the same batch and shall bear labels with same batch number. Visually inspect materials to be used for adjacent pieces to assure acceptable color match. Inspect in lighting conditions similar to those on Project.
  - 3. Variation in distribution of aggregates in quartz surfacing which are within manufacturer's tolerances is not a defect.
- E. Tools: Cut and polish with water-cooled power tools.
- F. Cutouts:
  - 1. Cutouts shall have 3/8 inch minimum inside corner radius. Inside corners shall be reinforced in an acceptable manner to prevent cracking.
  - 2. Where edges of cutout will be exposed in finished work, polish edges.
  - 3. If the remaining material outside a cutout is less than 3 inches wide, reinforce area by laminating it with a strip of quartz surfacing.
- G. Laminations: Laminate layers of quartz surfacing as required to create built-up [edges][trim][and other areas requiring additional thickness].

### PART 3 – EXECUTION

#### 3.1 EXAMINATION

- A. Site Verification:
  - 1. Field verify dimensions prior to fabrication.
  - 2. Verify that substrates supporting quartz surfaces are plumb, level, and flat to within 1/16 inch in 10 feet and that necessary supports and blocking are in place.
  - 3. Base Cabinets: Cabinet units shall be securely fixed to adjoining units and back wall.

#### 3.3 PREPARATION

- A. Protect finished surfaces against scratches. Apply masking where necessary. Guard against grit, dust, and other trades.

#### 3.4 INSTALLATION

- A. Install materials in accordance to manufacturer's recommendations. Lift and place to avoid breakage.
- B. Preliminary Installation and Adjustment: Position materials to verify that materials are correctly sized and prepared. Make necessary adjustments.
  - 1. If jobsite cutting, grinding, or polishing is required, use water-cooled tools. Protect jobsite and surfaces against dust and water. Perform work away from installation site if possible.
  - 2. Allow gaps for expansion of not less than 1/16 inch per five feet when installed between walls or other fixed conditions.
  - 3. Drainage: Adjacent to sinks and where drainage is required, shim countertops slightly to insure positive drainage.
- C. Permanent Installation:
  - 1. After verifying fit, remove quartz surfacing from position, clean substrates of dust and contamination, and clean quartz surfacing back side and joints with solvent.
  - 2. Apply sufficient quantity of mounting adhesive in accordance with adhesive manufacturer's recommendations to provide permanent, secure installation.
  - 3. Spacing of mounting adhesive shall not exceed:
    - a. Horizontal Surfaces: [---] inches on center.
    - b. Vertical Surfaces: [---] on center; provide temporary shims until adhesive cures.
  - 4. [Fasteners][Grout][Hardware]:
  - 5. Install surfacing plumb, level, and square and flat to within 1/16 inch in ten feet.

## SECTION 06 61 19 QUARTZ SURFACING FABRICATIONS

- D. Joints shall be flush, tight fitting, level, and neat.
- E. Securely join with stone adhesive. Fill joints level with quartz surfacing.
- F. Clamp or brace quartz surfacing in position until adhesive sets.
- G. Seal joints between backsplash and countertop with silicone sealer.

### 3.5 REPAIR

- A. Repair or replace damaged materials in a satisfactory manner.

### 3.6 CLEANING

- A. Remove masking and excess adhesives and sealants. Clean exposed surfaces.

### 3.7 PROTECTION

- A. Protect surfacing from damage by other Sections.

END OF SECTION



## SECTION 06 82 02 FRP BALLISTIC-RESISTANT PANELS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Concealed FRP ballistic-resistant panels.
- B. Where Required:
  - 1. At walls having ballistic-resistant glazing.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: for submittal requirements.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials.
- B. International Organization of Standardization (ISO).
- C. National Institute of Justice (NIJ).
- D. Underwriters laboratory (UL):
  - 1. UL 752, Standard for Bullet-Resisting Equipment.

#### 1.4 DESIGN REQUIREMENTS

- A. Through design, manufacturing technique and material application bullet-resistant fiberglass panels shall be of "non-ricochet type," intended to encapture and retain attacking projectile lessening potential of random injury or lateral penetration.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product Specifications and installation instructions for each product including other data as may be required to show compliance with these Specifications.

#### 1.6 DELIVERY, STORAGE & HANDLING

- A. Deliver materials to Project Site with the manufacturer's UL labels intact and legible.
- B. Handle material with care to prevent damage.
- C. Store materials inside under cover, stack flat and off floor.

### PART 2 - PRODUCTS

#### 2.1 FRP BALLISTIC-RESISTANT PANELS

- A. Panels shall be made of multiple layers of ballistic-grade fiberglass cloth impregnated with thermoset polyester resin and compressed into flat rigid sheets.
  - 1. Production technique and materials used shall provide controlled internal delamination to permit encapture of penetrating projectile.
  - 2. Ballistic-Resistant Standards: Meet UL 752 Level 3 and NIJ Level 3.
  - 3. Panel Size: 4 x 8 feet x nominal 1/2-inch thick.
- B. Acceptable Manufacturers: Contractor's choice.

### PART 3 - EXECUTION

#### 3.1 PREREPARATION

- A. Prior to installing the bullet resistive material the contractor shall verify that all supports have been installed as required by the contract documents and the architectural drawings

#### 3.2 INSTALLATION

- A. Installed FRP ballistic-resistant panels in accordance with the manufacturer's written recommendations.

## SECTION 06 82 02 FRP BALLISTIC-RESISTANT PANELS

- B. FRP ballistic-resistant panels shall be adhered using an industrial adhesive, mastic, screws or bolts.
- C. Method of application shall maintain bullet-resistive rating at junctures with concrete floor slab, concrete roof slab, bullet resistive door frames, bullet resistive window frames, and all required penetrations.
- D. Joints: Reinforce all panel joints with back-up layer of bullet resistive material.
  - 1. The bullet resistance of joint, as reinforced, shall be at least equal to that of panel.
  - 2. Minimum width of reinforcing layer at joint shall be 4 inches, 2 inches on each panel or a 2-inch minimum overlap.

END OF SECTION

## SECTION 06 83 00 FIBER REINFORCED LAMINATE (FRL)

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Fiberglass reinforced laminate wall panels (FRL).
- B. Accessories including adhesives and sealants.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions, and Division 01 apply to Work of this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: for Submittal Procedures.
- C. Section 09 06 10 – INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: for selected patterns and colors.
- D. Section 09 21 00 – GYPSUM BOARD ASSEMBLIES: for gypsum board substrate to receive FRL.
- E. Section 09 65 00 – RESILIENT FLOORING: for rubber base material above which Work of this Section is to be installed.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E84,
- B. National Electrical Manufacturer's Association (NEMA):
  - 1. NEMA LD3.13, Wear Resistance.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Manufacturer's literature describing product characteristics, accessories, and limitations.
- C. Manufacturer's Instructions: Indicate installation requirements, special procedures, and conditions requiring special attention.
- D. Color samples for verification.
- E. Maintenance Instructions:
  - 1. Submit under provisions of Section 01 78 23.
  - 2. Manufacturer's printed instructions for maintenance.
  - 3. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

#### 1.5 REGULATORY REQUIREMENTS

- A. Fire Rating: IBC Class A / UL Class A, tested to ASTM E84.

#### 1.6 PROJECT CONDITIONS

- A. Allow panels to acclimate for 48 hours in temperature environment reasonably close to installation space.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Panolam Industries International, Inc.  
[www.panolam.com](http://www.panolam.com)
- B. Substitution Requests: No substitutions allowed.

#### 2.2 FIBER REINFORCED PANELS

- A. Fiberglass Reinforced Laminate – Properties:
  - 1. Product: Thermofused melamine overlay, decorative paper and Fire Rated phenolic paper with fiber reinforcing inner layers.
  - 2. Nominal Thickness: 0.088 inches.
  - 3. Panel net size 36, 48, 60, 96, 120, and 144 inches.
  - 4. Surface Burning Characteristics: Rating of 25, or less, as tested to ASTM E84.
  - 5. Smoke Developed: 55, tested to ASTM E84.
  - 6. Wear Resistance: 3500, tested to NEMA3.13.

## SECTION 06 83 00 FIBER REINFORCED LAMINATE (FRL)

- 7. Flexural Strength: 20,148 psi, tested to ASTM D790.
- B. Panel Color, Texture, and Finish: As scheduled in Section 09 06 10.

### 2.3 ACCESSORIES

- A. Adhesive: As recommended by fiber reinforced laminate manufacturer.
- B. Molding or Trim: Fiber Reinforced Laminate may be used with standard trim available in appropriate size and configuration:
  - 1. Division Bars (between panels).
  - 2. Inside corners.
  - 3. Outside corners.
  - 4. Cap (top molding).
- C. Color matched joint caulking: As recommended by fiber reinforced laminate manufacturer.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Verify that conditions ready to receive Work of this Section before beginning.
- B. Verify that gypsum board substrate is smooth, plumb, and true, free of waves or bulges, and within tolerances specified in Section 09 21 00.

### 3.2 PREPARATION

- A. Clean substrate of dirt, dust, waxes and other bond breaking substances prior to beginning installation.

### 3.3 INSTALLATION

- A. Install panels with bottom edge located to clear top of resilient base specified in Section 09 65 00.
- B. Apply adhesive uniformly using adhesive manufacturers recommended notched trowel to entire back of panels completely to edge.
- C. Lay fiber reinforced laminate panels in place leaving approximately 1/8 inch between panel joints.
- D. Follow adhesive manufacturer's recommendations for set and application times.
- E. Apply pressure to entire panel face with laminate type 'J' roller, removing trapped air and ensure proper adhesion between interior surfaces.
- F. If no trim is used, seal panel joints and top, side and bottom edges with colored caulking to match panel color. Wipe smooth and remove excess from fiber reinforced laminate panel face.

### 3.4 ADJUSTING

- A. Replace installations out of plumb and not aligned with adjacent panels and construction.

### 3.5 CLEANING

- A. Clean panel face to remove soiling, stains, dust and dirt using clean rags and cleaning agents as recommended by fiber reinforced laminate manufacturer.
- B. Leave installation clean, free of residue and debris resulting from work of this Section.

END OF SECTION

## SECTION 07 14 00 HOT FLUID-APPLIED WATERPROOFING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Deck preparation.
- B. Reinforced waterproofing membrane with rigid insulation and filter and drainage courses.
- C. Reinforced waterproofing membrane with filter and drainage layers for soil and vegetation overburden.
- D. Seismic and expansion joints.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: for submittal of Product Data, Samples, and Certificates.
- C. Section 01 77 00 - CLOSEOUT PROCEDURES: for submittal of Warranties.
- D. Section 03 30 00 - CAST-IN-PLACE CONCRETE: for concrete substrate. Coordination of this Section is necessary for successful installation of waterproofing membrane.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM D41, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
  - 2. ASTM D4258, Standard Practice for Surface Cleaning Concrete for Coating.
  - 3. ASTM D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- B. Canadian General Standards Board (CGSB):
  - 1. CAN/CGSB 37.50-M89, Hot Applied, Rubberized Asphalt for Roofing and Waterproofing.
  - 2. CAN/CGSB 37.51-M90, Application for Hot-Applied Rubberized Asphalt, for Roofing and Waterproofing.
- C. Installation instructions and Details published by primary material manufacturer applicable to this Project.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Provide waterproofing that prevents the passage of water and complies with physical requirements in CAN/CGSB-37.50, "Hot Applied, Rubberized Asphalt for Roofing and Waterproofing."
- B. Material Compatibility: Provide waterproofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing/waterproofing manufacturer based on testing and field experience.
- C. FMG Listing:
  - 1. Provide FMG approved waterproofing assembly.
  - 2. Special Wind Region: For velocity pressures on entire assembly (including deck) of 160 lbf/sq. ft. perimeter uplift force, 160 lbf/sq. ft. corner uplift force, and 104 lbf/sq. ft. outward force on edges.
- D. UL Listing:
  - 1. Provide roofing/waterproofing system and components that have been tested for application and slopes indicated, and are listed by UL for Class A external fire exposure.
  - 2. Provide roof/waterproofing system materials bearing UL Classification marking on packaging, containers, rolls, etc., indicating that materials have been produced under UL's Classification and follow-up service.

#### 1.5 ABBREVIATIONS

- A. ICRI International Concrete Repair Institute
- B. ASTM International (formerly American Society for Testing and Materials)
- C. FMG Factory Mutual Global
- D. NRCA National Roofing Contractors Association

## SECTION 07 14 00 HOT FLUID-APPLIED WATERPROOFING

- E. UL Underwriters Laboratories
- F. TIMA Thermal Insulation Manufacturers Association

### 1.6 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties.
- B. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, ties to adjoining waterproofing, and other termination conditions.
- C. Samples: For the following products:
  - 1. Waterproofing membrane and reinforcing sheet.
  - 2. 12-by-12-inch square of flashing sheet.
  - 3. 24-by-24-inch square of insulation.
  - 4. Filter fabric materials – 12"x12".
  - 5. Drainage layer materials – 12"x12".
  - 6. Protection layer materials – 12"x12".
- D. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.
- E. Product Test Reports: From a qualified independent testing agency indicating and interpreting test results of waterproofing for compliance with requirements, based on comprehensive testing of current waterproofing formulations.
- F. Sample Warranty: Copy of special waterproofing manufacturer's and Installer's warranty stating obligations, remedies, limitations, and exclusions before starting waterproofing.

### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who is authorized, approved, or licensed to install waterproofing manufacturer's products; and who is eligible to receive waterproofing warranty specified.
- B. Source Limitations: Obtain waterproofing materials, sheet flashings, and protection course, through one source from a single manufacturer.
- C. Mockups: Apply waterproofing to 100 sq. ft. of horizontal substrate to demonstrate surface preparation, crack and joint treatment, corner treatment, thickness, texture, and execution quality. Install pavers and paver supports to demonstrate aesthetic affects and quality of materials and execution.
  - 1. If Architect determines mockups do not comply with requirements, reapply waterproofing and reinstall pavers until mockups are approved.
  - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 for waterproofing, including surface preparation specified under other Sections, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

### 1.8 DELIVERY, STORAGE, & HANDLING

- A. Deliver materials to Project site in original containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by waterproofing manufacturer.
- C. Remove and replace materials that cannot be applied within their stated shelf life.
- D. Protect stored materials from direct sunlight.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate, or when temperature is below 0 deg F.
  - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during application and curing of waterproofing materials.

1.10 WARRANTY

- A. Special Manufacturer's Warranty: Written warranty, signed by waterproofing manufacturer agreeing to repair or replace waterproofing and sheet flashings that do not comply with requirements or that do not remain watertight within specified warranty period.
  - 1. Waterproofing with insulation:
    - a. Warranty that insulation will retain 80 percent of original published thermal value.
    - b. Warranty Period: 15 years after date of Substantial Completion.
  - 2. Waterproofing with precast concrete pavers & pedestals:
    - a. Warranty pavers will not dish or warp and will not crack, split, or disintegrate in freeze-thaw conditions.
    - b. Warranty includes removing and reinstalling protection board, drainage panels, pedestals, and pavers where applicable.
    - c. Warranty Period: 15 years after date of Substantial Completion.
  - 3. Waterproofing with filter & drainage layers with soil & vegetation overburden:
    - a. Warranty includes removing and reinstalling protection board, drainage panels, filter layers, and soil/vegetation overburden.
    - b. Warranty Period: 15 years after date of Substantial Completion.
- B. Special Installer's Warranty: Written waterproofing Installer's warranty, signed by Installer, covering Work of this Section, for warranty period of two years.
  - 1. Warranty includes removing and reinstalling all overburden materials.
- C. Provide separate warranty for each separate assembly; manufacturer and contractor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the following products:
  - 1. American Hydrotech, Inc.; Monolithic Membrane 6125.
  - 2. Or Approved.

2.2 WATERPROOFING MEMBRANE

- A. Fully Reinforced, 215 mil final thickness minimum. Base coat to be 90 mil min., top coat 125 mil min.
- B. Single-component; 100 percent solids; hot fluid-applied, rubberized asphalt with the following properties measured per applicable test methods in CAN/CGSB-37.50:
  - 1. No U.S. product standard exists for hot fluid-applied, rubberized asphalt. Properties below are from CAN/CGSB-37.50. Additional properties may be reported by manufacturers. Add to list to suit Project.
  - 2. Flash Point: Not less than 260 deg C or not less than 25 deg C above manufacturer's maximum recommended application temperature.
  - 3. Cone Penetration: 110 maximum at 25 deg C, and 200 maximum at 50 deg C.
  - 4. Flow: 3 mm maximum at 60 deg C.
  - 5. Toughness: Not less than 5.5 J
  - 6. Ratio of Toughness to Peak Load: Not less than 0.040.
  - 7. Adhesion Rating: Pass.
  - 8. Water-Vapor Permeance: 1.7 ng/Pa x s x sq. m.
  - 9. Water Absorption: 0.35-g maximum mass gain, or 0.18-g maximum mass loss.

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10. Pinholing: None.
11. Low-Temperature Flexibility: No cracking.
12. Crack Bridging Capability: No cracking, splitting, or loss of adhesion.
13. Heat Stability: Comply with requirements for penetration, flow, low-temperature flexibility, and viscosity when heated for five hours at manufacturer's recommended application temperature.
14. Viscosity Test: 2 to 15 seconds.

### 2.3 AUXILIARY MEMBRANE MATERIALS

- A. Surface Conditioner: ASTM D 41-85, asphaltic surface conditioner for concrete by American Hydrotech
  1. Or Approved
- B. Elastomeric Flashing Sheet: 50-mil. minimum, nonstaining, uncured sheet neoprene with manufacturer's recommended contact adhesives and predrilled metal termination bars and anchors, with the following physical properties as measured per standard test methods referenced:
  1. Tensile Strength: 1400 psi minimum; ASTM D 412, Die C.
  2. Elongation: 200 percent minimum; ASTM D 412.
  3. Tear Resistance: 125 psi minimum; ASTM D 624, Die C.
  4. Brittleness: Does not break at minus 30 deg F; ASTM D 2137.
    - a. "Flex Flash UN" by American Hydrotech.
    - b. Or Approved.
- C. Sealants and Accessories: Waterproofing manufacturer's recommended sealants and accessories.
- D. Reinforcing Fabric: Manufacturer's recommended spun-bonded polyester fabric.
  1. "Flex Flash F" by American Hydrotech.
    - a. Protection Layer: ASTM D5147 Fiberglass reinforced, SBS modified bitumen sheet smooth surfaced; min. 0.085 – inch thick; for use as a protection sheet over completed membrane.
  2. "Hydroflex 10" by American Hydrotech.
  3. Or approved.

### 2.4 SEISMIC/EXPANSION JOINT

- A. Flat, vulcanized waterproofing joint integral with the waterproofing membrane to accommodate movements of up to 2", capable of 500% elongation at -40°F across its length and at all vulcanized points.
  1. "Redline 40" by Situra, Inc. for joint movement up to 2"
  2. Or approved.

### 2.5 FILTER & DRAINAGE SYSTEM FOR SPLIT SLAB ASSEMBLY (WP1)

- A. Composite Drainage System 1: Prefabricated Drainage Course consisting of a three-dimensional, crush-proof, drainage core and a filter fabric.
  1. "Hydrodrain 300" by American Hydrotech.
- B. Composite Drainage System 2 / Air Layer: Required air space over insulation shall be composed of a crush-proof core and non-woven filter fabric.
  1. "Hydrodrain AL" by American Hydrotech
- C. Filter Fabric: To be used as component of Composite Drainage Systems - Non-woven geotextile fabric by American Hydrotech, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation less than 50 percent; complying with the following properties determined according to AASHTO M 288:
  1. Survivability: Class 2.
  2. Apparent Opening Size: No. 30 sieve, maximum.
  3. Permittivity: 0.05 per second, minimum.
    - a. "Systemfilter" by American Hydrotech.
    - b. Or Approved.



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- D. Insulation Units: Extruded-polystyrene (EXPS) board insulation complying with ASTM C 578; of type, density, and compressive strength indicated below; fabricated with rabbeted edges and with one side having ribbed drainage channels.
  - 1. Include special paver sizes and add descriptions of custom pavers such as stair tread and riser units, coping or curbed termination pavers, and oversize pavers.
  - 2. Type VI, 2.2-lb/cu. ft. minimum density and 100-psi minimum compressive strength.
  - 3. Overall thickness of insulation assembly shall be 6-inches, unless otherwise indicated.
    - a. "Styrofoam" by Dow Corning.
    - b. Or Approved.
- E. Protection Layer: Fiberglass reinforced, rubberized asphalt sheet.
  - 1. "Hydroflex 30" by American Hydrotech.

### 2.6 FILTER & DRAINAGE SYSTEM FOR PRECAST CONCRETE PAVER/PLAZA DECK SYSTEM (WP2)

- A. Filter Fabric: To be used as component of Composite Drainage Systems - Non-woven geotextile fabric by American Hydrotech, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation less than 50 percent; complying with the following properties determined according to AASHTO M 288:
  - 1. Survivability: Class 2.
  - 2. Apparent Opening Size: No. 30 sieve, maximum.
  - 3. Permittivity: 0.05 per second, minimum.
    - a. "Systemfilter" by American Hydrotech.
    - b. Or Approved.
- B. Insulation Units: Extruded-polystyrene (EXPS) board insulation complying with ASTM C 578; of type, density, and compressive strength indicated below; fabricated with rabbeted edges and with one side having ribbed drainage channels.
  - 1. Include special paver sizes and add descriptions of custom pavers such as stair tread and riser units, coping or curbed termination pavers, and oversize pavers.
  - 2. Type VI, 2.2-lb/cu. ft. minimum density and 100-psi minimum compressive strength.
  - 3. Maximum water absorption by volume per ASTM C-272, 0.1%. Water vapor permeance for 1" product per ASTM E-96, 1.0 perm (max.) (63 ng/Pa/s/m<sup>2</sup>)
  - 4. Insulation shall have an R value of 5.0°F ft<sup>2</sup> h/Btu/in. (0.88 K m<sup>2</sup>/W) of thickness when tested at 75°F (23.9°C) mean temperature in accordance with ASTM C-518
  - 5. Overall thickness of insulation assembly shall be 6-inches, unless otherwise indicated.
    - a. "Styrofoam" by Dow Corning
    - b. Or approved.
- C. Composite Drainage System 1: Prefabricated Drainage Course consisting of a three-dimensional, crush-proof, drainage core and a filter fabric.
  - 1. "Hydrodrain 300" by American Hydrotech
  - 2. Or approved.
- D. Protection Layer: Fiberglass reinforced, rubberized asphalt sheet.
  - 1. "Hydroflex 30" by American Hydrotech
  - 2. Or Approved

### 2.7 FILTER & DRAINAGE SYSTEM FOR INTENSIVE VEGETATION OVERBURDEN (WP3)

- A. Composite Drainage System 3: Non-woven filter fabric and three dimensional molded polyethylene panels with drainage panels at top and bottom sides and water retention reservoirs top side.
  - 1. "Gardendrain GR 30" by American Hydrotech
  - 2. Or approved.

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- B. Composite Drainage System 1: Prefabricated Drainage Course consisting of a three-dimensional, crush-proof, drainage core and a filter fabric.
  - a. "Hydrodrain 300" by American Hydrotech
  - b. Or approved.
- C. Filter Fabric: To be used as component of Composite Drainage Systems - Non-woven geotextile fabric by American Hydrotech, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation less than 50 percent; complying with the following properties determined according to AASHTO M 288:
  - 1. Survivability: Class 2.
  - 2. Apparent Opening Size: No. 30 sieve, maximum.
  - 3. Permittivity: 0.05 per second, minimum.
    - a. "Systemfilter" by American Hydrotech.
    - b. Or Approved.
- D. Insulation Units: Extruded-polystyrene (EXPS) board insulation complying with ASTM C 578; of type, density, and compressive strength indicated below; fabricated with rabbeted edges and with one side having ribbed drainage channels.
  - 1. Include special paver sizes and add descriptions of custom pavers such as stair tread and riser units, coping or curbed termination pavers, and oversize pavers.
  - 2. Type VI, 2.2-lb/cu. ft. minimum density and 60-psi minimum compressive strength.
  - 3. Maximum water absorption by volume per ASTM C-272, 0.1%. Water vapor permeance for 1" product per ASTM E-96, 1.0 perm (max.) (63 ng/Pa/s/m<sup>2</sup>)
  - 4. Insulation shall have an R value of 5.0°F ft<sup>2</sup> h/Btu/in. (0.88 K m<sup>2</sup>/W) of thickness when tested at 75°F (23.9°C) mean temperature in accordance with ASTM C-518
  - 5. Overall thickness of insulation assembly shall be 6-inches, unless otherwise indicated.
    - a. "Styrofoam" by Dow Corning
    - b. Or approved.
- E. Root Barrier/Protection Layer: Reinforced, rubberized asphalt sheet with granular surface and root inhibiting additive.
  - 1. Minimum thickness: 0.160-inch (160 mils)
  - 2. Minimum weight: 98 pounds per 100 sf.
    - a. "Hydroflex RB" by American Hydrotech
    - b. Or Approved.
- F. Inspection Boxes: Polypropylene-constructed inspection boxes with stainless steel hardware. Stackable units for installation at various thicknesses of soil and vegetation; lockable access covers with drainage.
- G. Soil as specified by Landscape Architect.

### 2.8 FILTER & DRAINAGE SYSTEM FOR EXTENSIVE GARDEN ROOF ASSEMBLY (WP4)

- A. Composite Drainage System 3: Non-woven filter fabric and three dimensional molded polyethylene panels with drainage panels at top and bottom sides and water retention reservoirs top side.
  - 1. "Gardendrain GR 30" by American Hydrotech
  - 2. Or approved.
- B. Composite Drainage System 1: Prefabricated Drainage Course consisting of a three-dimensional, crush-proof, drainage core and a filter fabric.
  - 1. "Hydrodrain 300" by American Hydrotech
  - 2. Or approved.
- C. Filter Fabric: To be used as component of Composite Drainage Systems - Non-woven geotextile fabric by American Hydrotech, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation less than 50 percent; complying with the following properties determined according to AASHTO M 288:
  - 1. Survivability: Class 2.
  - 2. Apparent Opening Size: No. 30 sieve, maximum.

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3. Permittivity: 0.05 per second, minimum.
    - a. "Systemfilter" by American Hydrotech.
    - b. Or Approved.
  - D. Protection Layer: Fiberglass reinforced, rubberized asphalt sheet.
    1. "Hydroflex 30" by American Hydrotech
    2. Or Approved
  - E. Root Barrier: Reinforced, rubberized asphalt sheet with granular surface and root inhibiting additive.
    1. Minimum thickness: 0.160-inch (160 mils)
    2. Minimum weight: 98 pounds per 100 sf.
      - a. "Hydroflex RB" by American Hydrotech
      - b. Or Approved.
  - F. Insulation Units: Extruded-polystyrene (EXPS) board insulation complying with ASTM C 578; of type, density, and compressive strength indicated below; fabricated with rabbeted edges and with one side having ribbed drainage channels.
    1. Include special paver sizes and add descriptions of custom pavers such as stair tread and riser units, coping or curbed termination pavers, and oversize pavers.
    2. Type VI, 2.2-lb/cu. ft. minimum density and 60-psi minimum compressive strength.
    3. Maximum water absorption by volume per ASTM C-272, 0.1%. Water vapor permeance for 1" product per ASTM E-96, 1.0 perm (max.) (63 ng/Pa/s/m<sup>2</sup>)
    4. Insulation shall have an R value of 5.0°F ft<sup>2</sup> h/Btu/in. (0.88 K m<sup>2</sup>/W) of thickness when tested at 75°F (23.9°C) mean temperature in accordance with ASTM C-518
    5. Overall thickness of insulation assembly shall be 6-inches, unless otherwise indicated.
      - a. "Styrofoam" by Dow Corning
      - b. Or approved.
  - G. Inspection Boxes: Polypropylene-constructed inspection boxes with stainless steel hardware. Stackable units for installation at various thicknesses of soil and vegetation; lockable access covers with drainage.
  - H. Soil as specified by Landscape Architect.
- 2.9 FILTER & DRAINAGE SYSTEM FOR SPLIT SLAB ASSEMBLY (WP5)
- A. Protection Layer: Fiberglass reinforced, rubberized asphalt sheet.
    1. "Hydroflex 30" by American Hydrotech
    2. Or Approved
  - B. Filter Fabric: To be used as component of Composite Drainage Systems - Non-woven geotextile fabric by American Hydrotech, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation less than 50 percent; complying with the following properties determined according to AASHTO M 288:
    1. Survivability: Class 2.
    2. Apparent Opening Size: No. 30 sieve, maximum.
    3. Permittivity: 0.05 per second, minimum.
      - a. "Systemfilter" by American Hydrotech.
      - b. Or Approved
  - C. Composite Drainage System 1: Prefabricated Drainage Course consisting of a three-dimensional, crush-proof, drainage core and a filter fabric.
    1. "Hydrodrain 300" by American Hydrotech.
- 2.10 FILTER & DRAINAGE SYSTEM FOR INTENSIVE LANDSCAPING ASSEMBLY (WP6)
- A. Composite Drainage System 4: Non-woven filter fabric and three dimensional molded polyethylene panels with drainage panels at top and bottom sides and water retention reservoirs top side.
    1. "Gardendrain GR 50" by American Hydrotech
    2. Or approved.

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- B. Filter Fabric: To be used as component of Composite Drainage Systems - Non-woven geotextile fabric by American Hydrotech, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation less than 50 percent; complying with the following properties determined according to AASHTO M 288:
  - 1. Survivability: Class 2.
  - 2. Apparent Opening Size: No. 30 sieve, maximum.
  - 3. Permittivity: 0.05 per second, minimum.
    - a. "Systemfilter" by American Hydrotech.
    - b. Or Approved.
- C. Root Barrier/Protection Layer: Reinforced, rubberized asphalt sheet with granular surface and root inhibiting additive.
  - 1. Minimum thickness: 0.160-inch (160 mils)
  - 2. Minimum weight: 98 pounds per 100 sf.
    - a. "Hydroflex RB" by American Hydrotech
    - b. Or Approved.
- D. Inspection Boxes: Polypropylene-constructed inspection boxes with stainless steel hardware. Stackable units for installation at various thicknesses of soil and vegetation; lockable access covers with drainage.
- E. Soil as specified by Landscape Architect.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
  - 1. Verify that concrete substrate have cured and aged for minimum time period recommended by waterproofing manufacturer.
  - 2. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Clean and prepare substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for waterproofing application.
  - 1. All concrete surfaces must be dry, smooth, free of depressions, voids, protrusions, clean and free of unapproved curing compounds, form release agents and other surface contaminants.
    - a. All concrete surfaces shall be No. 2 finish or better in accordance with ICRI standards.
    - b. Remove all existing roofing materials and other contaminants that may affect adhesion of new waterproofing membrane. Use grinders or other mechanical means to remove all materials not allowed to remain on the surface of existing concrete.
    - c. Surfaces to receive new waterproofing materials must be clean and smooth concrete, free of all foreign debris.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.
- D. Remove grease, oil, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
  - 1. Retain subparagraph below for decks when a controlled substrate surface finish is needed for waterproofing adhesion.

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2. Abrasive blast clean concrete surfaces uniformly to expose top surface of fine aggregate according to ASTM D 4259 with a self-contained, recirculating, blast-cleaning apparatus. Remove material to provide a sound surface free of laitance, glaze, efflorescence, curing compounds, concrete hardeners, or form-release agents. Remove remaining loose material and clean surfaces according to ASTM D 4258.
  - E. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, and other voids.
- 3.3 JOINTS, CRACKS, & TERMINATIONS
- A. Prepare and treat substrates to receive waterproofing membrane, including joints and cracks, deck drains, corners, and penetrations according to CAN/CGSB-37.51, "Application of Rubberized Asphalt, Hot-Applied, for Roofing and Waterproofing," and waterproofing system manufacturer's written instructions.
    1. Rout and fill joints and cracks in substrate. Before filling, remove dust and dirt according to ASTM D 4258.
    2. Embed reinforcing fabric into a layer of hot, rubberized asphalt. Extend reinforcing fabric a minimum of 6-inches on each side of joints and cracks and beyond deck drains, corners, and penetrations.
  - B. At expansion joints and discontinuous deck-to-wall or deck-to-deck joints, bridge joints with premanufactured expansion/seismic joint material and elastomeric flashing sheet extended a minimum of 6-inches on each side of joints and adhere to substrates in a layer of hot, rubberized asphalt.
- 3.4 FLASHING INSTALLATION
- A. Install flashing sheets at terminations of waterproofing membrane according to CAN/CGSB-37.51, "Application of Rubberized Asphalt, Hot-Applied, for Roofing and Waterproofing," and waterproofing system manufacturer's written instructions.
  - B. Prime substrate with asphalt primer.
  - C. Install elastomeric flashing sheet and adhere to deck and wall substrates in a layer of hot, rubberized asphalt.
  - D. Extend flashing sheet up walls or parapets a minimum of 8-inches where applicable without extending above bottom edge of finish paver elevation or as shown on drawings and 6-inches onto deck to be waterproofed.
  - E. Install termination bars and mechanically fasten to top of flashing sheet at terminations and perimeter of roofing at 8-inches on center with concrete expansion anchors.
- 3.5 MEMBRANE APPLICATION
- A. Install reinforced waterproof membrane in areas indicated on the Drawings.
  - B. Apply rubberized asphalt according to CAN/CGSB-37.51, "Application of Rubberized Asphalt, Hot-Applied, for Roofing and Waterproofing," and manufacturer's written instructions.
  - C. Heat rubberized asphalt in an oil- or air-jacketed smelter with mechanical agitator specifically designed for heating rubberized-asphalt waterproofing.
  - D. Start application with manufacturer's technical representative present.
  - E. Apply primer, at manufacturer's recommended rate, over prepared substrate and allow to dry.
  - F. Reinforced Membrane: Apply waterproofing to substrates and adjoining surfaces indicated. Spread hot fluid-applied, rubberized asphalt to a thickness of 90 mils; embed reinforcing fabric, overlapping sheets 2-inches; and spread another 125-mil- thick layer to provide a uniform, reinforced, seamless membrane 215 mils thick minimum.
  - G. Apply waterproofing over prepared joints and up wall terminations and vertical surfaces to heights indicated or required by manufacturer.
  - H. Cover waterproofing with protection layer before membrane is subject to traffic.
    1. Install protection layer with weather-lapped joints.

## 3.6 INSULATION INSTALLATION

- A. Install insulation units in areas indicated on the Drawings.
- B. Install one or more layers of board insulation to achieve required thickness over waterproofed surfaces. Cut and fit to within 3/4 inch of projections and penetrations.
- C. On horizontal surfaces, loosely lay insulation units according to manufacturer's instructions. Stagger end joints and tightly abut insulation units.

## 3.7 PRECAST CONCRETE PAVER INSTALLATION

- A. Protect waterproofing membrane and other system components before and during installation of precast concrete paver assembly.
- B. Install concrete pavers in areas indicated on the Drawings and in accordance with the Manufacturer's written guidelines.
- C. Install concrete pavers and adjustable pedestals in locations indicated according to manufacturer's written instructions.
- D. Accurately install pedestals and other accessories to elevations required. Adjust for final level and slope with shims.
  - 1. Fill pedestal with concrete mix, strike smooth with top of pedestal, and cure according to ACI 301.
- E. Loosely lay pavers on pedestals, maintaining a uniform open joint width. Tightly seat pavers against spacers to eliminate lateral movement or drift of paving assembly. Align joint patterns parallel in each direction.
  - 1. Lay out pavers to avoid less-than-half-width pavers at perimeter or other terminations.
- F. Install pavers to not vary more than 1/16 inch in elevation between adjacent pavers or more than 1/16 inch from surface plane elevation of individual paver.
- G. Maintain tolerances of paving installation within 1/4 inch in 10 feet of surface plane in any direction.

## 3.8 FILTER &amp; DRAINAGE SYSTEM INSTALLATION

- A. Coordinate installation of filter and drainage materials with installation of overburden materials as shown on the Drawings.
- B. Cover waterproofing with Protection Layer / Root Barrier material before membrane is subject to traffic. Install with all side and end laps weather lapped a minimum of 4-inches, or as otherwise recommended by manufacturer. Extend up all vertical surfaces.
- C. Install insulation as shown on the Drawings. Butt joints tight and cut and fit to within 3/4 inch of projections and penetrations.
- D. Install Filter / Drainage Layer over insulation layer where shown on Drawings. Lap sheets a minimum of 4-inches. Extend material up all vertical surfaces to soil line.
- E. Install Drainage Layer / Aeration Layer, where shown on Drawings, loose laid over the entire surface of areas to receive overburden and cut to fit within 1-inch of penetrations. Lap edges and ends of geotextile fabric to maintain continuity and secure to one another as required to achieve stability. Protect installed molded-sheet drainage panels during subsequent construction.
- F. Install Filter Layer materials continuously over drainage layer with sides and ends lapped a minimum of 12-inches. Extend material up all vertical surfaces and terminate above soil line. Cut to fit tight around all penetrations, and install additional layer around pipes and clamp into position with material extended a minimum of 6-inches over field material.

## 3.9 FIELD QUALITY CONTROL

- A. Flood Testing: Where substrate is over occupied space, flood test each horizontal surface area for leaks, according to recommendations in ASTM D 5957, after completing waterproofing but before overlying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.
  - 1. Flood to an average depth of 3-inches with a minimum depth of 2 inch and not exceeding a depth of 4-inches. Maintain 2-inches of clearance from top of sheet flashings.
  - 2. Flood each area for 72 hours.

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3. After flood testing, repair leaks, repeat flood tests, and make further repairs until waterproofing installation is watertight.
- B. Engage an independent testing agency to observe flood testing and examine underside of decks and terminations for evidence of leaks during flood testing.

### 3.10 CURING, PROTECTING, & CLEANING

- A. Cure waterproofing according to manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.
  1. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Protect installed board insulation from damage due to ultraviolet light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION





## SECTION 07 14 16 COLD FLUID-APPLIED WATERPROOFING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide cold fluid-applied waterproofing in accordance with the Contract Documents.
- B. Where Required:
  - 1. Over wood lagging on shored basement walls.
  - 2. On earth-side of formed basement walls, from top of footings to grade.
  - 3. Sides and bottoms of elevator pit.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of Product Data, Samples, and Certificates.
- C. Section 01 77 00 - CLOSEOUT PROCEDURES: Submittal of Warranties.
- D. Section 31 30 00F - EARTHWORK.
- E. Structural Drawings, General Notes: Wood lagging.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C898, Standard Guide for Use of High Solids Content , Cold Liquid-Applied Elastomeric Waterproofing Membrane with Separate Wearing Course.
  - 2. ASTM D4258, Standard Practice for Surface Cleaning Concrete for Coating.
- B. Installation instructions and Details published by primary material manufacturer applicable to this Project.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide waterproofing system that prevents passage of liquid water under hydrostatic pressure and complies with physical requirements as demonstrated by testing performed by an independent testing agency of manufacturer's current waterproofing formulations and system design.

#### 1.5 QUALITY ASSURANCE

- A. Successful installation of cold fluid-applied waterproofing system is sensitive to quality of workmanship.
- B. Installer Qualifications: A firm having specialized experience installing waterproofing systems specified for this Project and the following:
  - 1. Licensed by or acceptable to the manufacturer of the primary materials.
  - 2. Employ experienced workers for this Project that are trained and competent in techniques required by manufacturer for installation of specified waterproofing system.

#### 1.6 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit copies of manufacturer's specifications, installation instructions and standard details. Include only specific details to be used on this Project or highlight applicable details in manufacturer's catalog.
- C. Test Data: Submit test data as may be required to demonstrate compliance with Contract Documents.
- D. Substrate Acceptability Statement: Submit certified statement issued by manufacturer of primary materials, and countersigned by installer, attesting that all areas and surfaces designated to receive waterproofing and flashing have been inspected and found accessible and satisfactory to receive Work of this Section, and are not in conflict with Warranty requirements.

#### 1.7 FIELD MOCK-UP

- A. Apply waterproofing system to field sample of not less than 100 square feet of installed drainage mat to demonstrate surface preparation, joint, crack and penetration treatment, thickness, texture, and standard of workmanship.

## SECTION 07 14 16 COLD FLUID-APPLIED WATERPROOFING

- B. Notify Architect and Contracting Officer not less than 5 working days prior to scheduled date when field mock-up will be installed.
  - C. Re-apply waterproofing system, if required, to satisfaction of Architect and acceptable to manufacturer's technical field representative.
  - D. Retain and maintain approved field Mock-Up during construction in undisturbed condition as a standard for judging the completed Work.
    - 1. Undamaged field Mock-Up may become part of completed Work.
- 1.8 PRODUCT DELIVERY, STORAGE & HANDLING
- A. Deliver materials in factory-sealed and labeled packaging.
  - B. Sequence deliveries to avoid delays, while minimizing on-site storage.
  - C. Handle and store following manufacturer's instructions, recommendations and material safety data sheets.
  - D. Protect from construction operation-related damage, as well as damage from weather, excessive temperatures and prolonged exposure to sunlight.
  - E. Remove and replace material that has been damaged or that cannot be applied within its stated shelf life.
- 1.9 PROJECT CONDITIONS
- A. Protect all adjacent areas not to be waterproofed. Where necessary, apply masking to prevent staining of surfaces to remain exposed wherever membrane abuts other finish surfaces.
  - B. Substrate Conditions: Proceed with Work only when substrate construction and preparation Work is complete and in condition to receive waterproofing system.
  - C. Weather Conditions: Perform Work only when existing and forecasted weather conditions are within guidelines established by manufacturer of waterproofing materials.
  - D. Do not apply waterproofing materials into conditions of standing or ponding water.
  - E. Product application requires not less than 24-inches clearance.
  - F. Prior to membrane application, all plumbing, electrical, mechanical and structural Work to be under or passing through the waterproof membrane shall be positively secured in proper position and appropriately protected.
  - G. Waterproof membrane shall be installed before placement of reinforcing steel.
    - 1. When not possible, all exposed reinforcing steel shall be masked by General Contractor prior to membrane application.
- 1.10 PRE-INSTALLATION CONFERENCE
- A. Convene pre-installation conference prior to application of waterproofing system to assure proper soil substrate and installation conditions.
    - 1. Required attendance: Contractor, Installer, Architect, Contracting Officer, manufacturer's technical field representative.
- 1.11 WARRANTY
- A. Submit under the provisions of Section 01 77 00.
  - B. Submit warranty executed by primary material manufacturer and co-signed by Installer against leaks resulting from defects in material or workmanship.
  - C. Warranty Period: 3 years after Date of Substantial Completion.
  - D. Upon notification of such defects, within the Warranty Period, make necessary repairs and replacements including removal and replacement of Work superimposed on the cold fluid-applied waterproofing at the convenience of Owner.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Single Source Responsibility: Except as otherwise specified, provide all waterproofing system components from one manufacturer.
- B. Approved Manufacturer: EPRO Services, Inc., [www.eproserve.com](http://www.eproserve.com).
  - 1. System III Plus, spray-applied Ecoline-S and Drainage panel Ecodrain-E are the basis of design.

## SECTION 07 14 16 COLD FLUID-APPLIED WATERPROOFING

### 2.2 MATERIALS

- A. Fluid-Applied Waterproofing System: Ecoline-S; a single-course, high build, polymer modified, asphalt emulsion. Waterborne, spray-applied at ambient temperatures. Nominal 80 mils, but not less than 60 mils dry thickness unless otherwise noted.

### 2.3 AUXILIARY MATERIALS

- A. Sheet Flashing: Manufacturer's 60-mil reinforced modified asphalt sheet with double-sided adhesive.
- B. Reinforcing Strip: Manufacturer's recommended polypropylene or polyester fabric.
- C. Joint/Penetration Detailing Sealant: Manufacturer's high viscosity polymer-modified water-based asphalt material.
  - 1. "Ecoline- R" as manufactured by EPRO Services.
- D. Backer Rod: Closed-cell polyethylene foam.

### 2.4 MOLDED-SHEET DRAINAGE PANEL

- A. Manufacturer's HDPE composite drainage panel Ecodrain-E for receipt of spray-applied membrane.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine soil substrates, areas, and conditions under which waterproofing systems will be applied, with installer present, for compliance with requirements.
- B. All surfaces to be waterproofed shall be approved by installer not less than one day prior to commencing Work.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 SURFACE PREPARATION

- A. Provide not less than 24-inches clearance out from surfaces to receive waterproof membrane.
- B. Lagging wall surface shall be clean and free of dirt and debris.
  - 1. Prepare and provide to installer the application surface in accordance with membrane manufacturer's requirements
- C. Soil Preparation:
  - 1. Soil or rock anchor installation is completed.
  - 2. Adequate soil compaction.

### 3.3 INSTALLATION - GENERAL

- A. Comply with manufacturer's printed instructions and directions of manufacturer's technical field representative, except where more stringent requirements are shown or specified, and except where Project conditions require extra precautions or provisions to ensure satisfactory performance of Work.
  - 1. Waterproofing product shall not be applied when temperatures are less than 45°F.

### 3.4 DRAINAGE PANEL INSTALLATION

- A. Place and secure drainage panels to soil substrate with geo-textile facing soil and flat flange extending upward.
- B. Install drainage panel over soil anchors by slitting the panel vertically and sliding it over the anchor. Flash anchor penetrations as described in 3.5 "Preparation and Treatment at Terminations and Penetrations".
- C. Overlap edges of dimpled core and ends of geo-textile 6-inches minimum on both horizontal and vertical seams to maintain continuity. Apply manufacturer's joint sealant material between overlap dimples to form flexible gasket and to act as adhesive.
- D. Protect installed panels during subsequent construction until application of waterproofing membrane.

## SECTION 07 14 16 COLD FLUID-APPLIED WATERPROOFING

### 3.5 PREPARATION & TREATMENT AT TERMINATIONS & PENETRATIONS

- A. Prepare vertical and horizontal surfaces including back of drainage panel at terminations, at penetrations through waterproofing material, and at expansion joints, drains, and sleeves in accordance with ASTM C898 and manufacturer's recommendations.
- B. Apply two coats, 30 mils thickness each, of manufacturer's joint sealant material. Embed joint reinforcing strip in first coat and apply second coat over embedded joint reinforcing strip, taking care to completely saturate and cover strip.
  - 1. Treat terminations 6 inches up vertical and 6 inches on horizontal surfaces.
  - 2. Treat penetrations in 6-inch radius around penetration and 3 inches onto penetrating object.

### 3.6 PREPARATION & TREATMENT OF JOINTS & SEAMS

- A. Prepare, treat, and fill joints in substrate and seams in drainage mat in accordance with ASTM C898 and waterproofing manufacturer's recommendations. Remove dust and dirt from joints and seams per ASTM D4258 prior to coating surfaces.
- B. Vertical Joint: Apply two coats of manufacturer's joint sealant material, 6 inches on each side of joint. Embed joint reinforcing strip in first coat and apply second coat over embedded joint reinforcing strip, taking care to completely saturate and cover strip.
- C. Horizontal Joint: Install sheet flashing over reinforced joint sealant material to deck and wall substrates where indicated or required according to waterproofing manufacturer's recommendations.

### 3.4 COLD FLUID-APPLIED WATERPROOFING

- A. Set up spray equipment according to manufacturer's instructions.
- B. Mix materials per manufacturer's instructions. Provide formulations of material and application methods that will not flow down on vertical surfaces.
- C. Start installing waterproofing in presence of manufacturer's technical field representative.
- D. Apply waterproofing material per manufacturer's recommendations and instructions by manufacturer's technical field representative.
- E. Apply waterproofing in and around soil anchor penetrations and cavities (bird beaks) copiously to ensure formation of monolithic gasket to receive specially placed concrete.
- F. Apply waterproofing to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details.
- G. Verify film thickness of waterproofing every 100 square feet.
- H. Protect adjacent materials or finished construction from over-spray.

### 3.5 FIELD QUALITY CONTROL

- A. Membrane may be checked for coverage with a lightly oiled, needle nose depth gauge, taking four (4) readings over a one square-inch area, every 500 square feet.
  - 1. Record the minimum reading.
  - 2. Mark the test area for repair.
- B. Test areas are to be patched over with Ecoline-S to an 80 mil minimum dry thickness, extending not less than one-inch beyond the test perimeter.

### 3.6 CURING, PROTECTING & CLEANING

- A. Cure waterproofing per manufacturer's recommendations, taking care to prevent contamination and damage during application stages and curing.
- B. Clean spillage and soiling from adjacent Work using cleaning agents and procedures recommended by manufacturer of affected Work.

END OF SECTION

## SECTION 07 17 00 BENTONITE WATERPROOFING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide bentonite waterproofing in accordance with the Contract Documents.
- B. Where Required:
  - 1. [insert]

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of Product Data, Samples, and Certificates.
- C. Section 31 20 00 - EARTHWORK.
- D. Structural Drawings, General Notes: Wood lagging.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Installer shall have at least three (3) years experience in Work of the type required by this Section, who comply with manufacturer's warranty requirements, and who is an approved applicator as determined by waterproofing system manufacturer.
- B. Manufacturer's Responsibility:
  - 1. Review Specifications and waterproofing details and provide a letter, addressed to the General Contractor, stating that:
    - a. The materials and usage of the materials are in accordance with the manufacturer's intended usage and recommended installation details, or
    - b. The materials and usage of the materials need to be modified for specific recommendations to be in accordance with manufacturer's recommended installation guidelines.
  - 2. Inspection: Manufacturer's representative shall inspect waterproofing installation periodically during application to verify that waterproofing has been installed in accordance with manufacturer's guidelines and recommendations.
- C. Pre-Installation Conference: Conduct pre-installation conference prior to commencement of field installation.
  - 1. Establish procedures for maintaining required working conditions and to coordinate this Work with related and adjacent Work.
  - 2. Verify that final waterproofing details comply with waterproofing manufacturer's current installation requirements and recommendations.
- D. Materials: Obtain bentonite waterproofing and accessory materials from same manufacturer to assure material compatibility.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit copies of manufacturer's Specifications, installation instructions and standard Details. Include only specific details that will be used on Project or highlight details in manufacturer's catalog.
- C. Product Samples: Submit representative samples of the following for approval:
  - 1. Bentonite geotextile membrane waterproofing.
- D. Contractor Certificate: At time of bid, submit written certification that installer has current approved applicator status with waterproofing material manufacturer.

#### 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in factory-sealed and labeled packaging.
- B. Sequence deliveries to avoid delays, while minimizing on-site storage.
- C. Handle and store following manufacturer's instructions, recommendations and material safety data sheets.
- D. Protect from construction operation-related damage, as well as damage from weather, excessive temperatures and prolonged exposure to sunlight.
- E. Remove damaged material from Project site and dispose of in accordance with applicable regulations.

## SECTION 07 17 00 BENTONITE WATERPROOFING

- F. Do not double-stack pallets during shipping or storage.
- G. Protect stored waterproofing materials from moisture, excessive temperatures and sources of ignition.
- H. Provide cover, top and all sides, for materials stored on-site, allowing for adequate ventilation.

### 1.6 PROJECT CONDITIONS

- A. Substrate Conditions: Proceed with Work only when substrate construction and preparation Work is complete and in condition to receive waterproofing system.
- B. Weather Conditions: Perform Work only when existing and forecasted weather conditions are within the guidelines established by the manufacturer of the waterproofing materials.
- C. Do not apply waterproofing materials into conditions of standing or ponding water.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Basis of Design: Voltex bentonite waterproofing with applicable accessories as manufactured by Colloid Environmental Technologies Company (CETCO), 1500 West Shure Drive, Arlington Heights, Illinois 60004-1440, USA. Website: [www.cetco.com](http://www.cetco.com).
  - 1. Acceptance alternate: Tremco "Paraseal LG" and "Tremdrain" multi-composite drainage and protection board.

### 2.2 MATERIALS

- A. Volclay Voltex: 4' x 15' roll of interlocked geotextiles encapsulating a minimum of 1.10 pound per square foot of granular sodium bentonite. Composite shall consist of one woven and one non-woven polypropylene geotextile, interlocked using a needle-punching process. The non-woven geotextile fibers shall pass through the bentonite layer and integrate into the woven geotextile to produce several interlocks each square inch over the entire surface area of product.
- B. Accessory Waterproofing Products: All accessory waterproofing materials shall be provided by the bentonite waterproofing manufacturer or shall have manufacturer's written approval for Substitution.
  - 1. Volclay Bentoseal: Trowel grade sodium bentonite compound used as detailing mastic around penetrations, corner transitions and grade terminations.
  - 2. Volclay Waterstoppage: 50 pound bag of specially processed dry granular sodium bentonite.
  - 3. Volclay Waterstop-RX 101T: Rolls of flexible bentonite / butyl rubber strip waterstop for use in new concrete construction joints. Secured with Volclay WB-Adhesive.
- C. Prefabricated Drainage Composite: Aquadrain drainage composite by CETCO shall be used where indicated to promote positive drainage, while serving as a protection course for the waterproofing. Use and install specific products as recommended by manufacturer.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Examine surfaces specified to receive waterproofing to assure they are in condition acceptable to manufacturer's requirements.
- B. Do not proceed with installation until surfaces are satisfactory. The surfaces shall not be acceptable until:
  - 1. All sharp protrusions over 1/4 inch, debris, standing water, ice and other materials which could harmfully affect the performance of the waterproofing system have been removed.

## SECTION 07 17 00 BENTONITE WATERPROOFING

2. All tie holes, deep honeycomb (over 1/4 inch), and exposed reinforcing steel have been filled or covered.

### 3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's product data, including product application and installation instructions, as well as manufacturer's shipping and storage recommendations.
- B. Install Voltex Waterproofing System with the woven side (dark gray) of the geotextile liner facing the concrete to be waterproofed in both horizontal and vertical applications.
- C. Prevent bentonite waterproofing products from hydrating before material is contained with overburden or backfill. When threat of rain is imminent, installed bentonite products not already contained by overburden or backfill should be covered with polyethylene sheeting to decrease the chance of hydration. Remove polyethylene prior to overburden or backfill operations.
- D. Joints With Potential Movement: Place hydrobar tube over joints between Utilidor and basement walls. Install a 24 inch wide strip of Voltex centered over the joint. Then place the main course of Voltex.

### 3.3 BACKFILLED WALLS

- A. Trowel 3/4 inch thick Bentoseal cant at all inside corner transitions.
- B. Starting at the base of the excavated wall, install Voltex sheet horizontally (dark gray woven geotextile against the wall). Attach Voltex using washer-headed mechanical fasteners centered 24 inches around the edge. Stagger all vertical overlap seams a minimum of 24 inches.
- C. Detail around all penetrations with 3/4 inch cant of Bentoseal. Extend Bentoseal 1/4 inch thick over substrate a minimum radius of 6 inches around penetration. Cut Voltex to fit snugly around penetrations.
- D. Terminate 2 inches below grade with metal termination bar fastened 12 inches on center. Cover top edge of Voltex with 1/2 inch thick, 2 inch wide layer of Bentoseal.
- E. Inspect finished Voltex installation and repair any damaged material prior to backfill placement. Assure that Voltex is not displace during backfill placement.

### 3.4 SOLDIER PILE AND LAGGING RETENTION WALLS

- A. Attach Voltex horizontally (dark gray woven geotextile outward facing installer) over lagging with washer-head mechanical fasteners 24 inches on center around the edge. Overlap all seams a minimum of 4 inches. Stagger all vertical overlap seams a minimum of 24 inches. Waterproofing shall not be installed over soldier piles.
- B. Detail around soldier piles and penetrations with 3/4 inch cant of Bentoseal. Apply Bentoseal cant to lagging where lagging butts to poured foundation walls. Extend 1/4 inch Bentoseal over substrate a minimum radius of 6 inches around penetration and 6 inch wide along edges of soldier beams. Cut Voltex to fit snugly around penetrations and soldier piles.
- C. Terminate at top of horizontal lagging and fasten 12 inches on center. After walls above have been constructed, extend waterproofing to 2 inches below exterior grade or bottom of slab on grade as applicable.
- D. Inspect finished Voltex installation and repair any damaged material prior to shotcrete placement. Assure that Voltex is not displaced during concrete or shotcrete placement.

### 3.5 COMPLETION

- A. Coordinate Work with earthwork so that waterproofing is installed just prior to backfilling. Material susceptible to rain shall not be installed in wet weather.
- B. Replace all material damaged by weather. Repair punctures and edge damage per manufacturer's instructions.

END OF SECTION





PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. All labor, materials and equipment to install vehicular traffic coating system in accordance with the Contract Documents.
- B. Surface preparation.
- C. Crack and joint detailing.
- D. Deck Coating Installer shall also be specifically responsible for providing all of the preparation Work and the joint sealants specified in Section 07 92 00, expansion joints and clear penetrating sealers specified in Section 03 30 00.
- E. Where Required: At the roadway extension south of Martin Luther King between grid lines 11 and 12.

1.2 RELATED SECTIONS

- A. Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES.
- C. Section 03 30 00 – CAST-IN-PLACE CONCRETE: for substrate to receive traffic vehicular coating, expansion joints and penetrating sealer.
- D. Section 07 92 00 – JOINT SEALANTS.
- E. Section 32 17 23 - PAVEMENT MARKINGS.

1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C957, Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface.
  - 2. ASTM D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- B. Brookfield RVT No. 5 at 20 RPM.

1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Submit for review and approval a complete description of the vehicular traffic coating system proposed, including all related materials and surface preparation methods to be employed.
- C. Submit two copies of manufacturer's literature for all products furnished, including physical properties, performance properties, application information, appropriate Material Safety Data Sheets (MSDS) and other safety requirements.
- D. Submit for record ASTM C957 test results for thin deck coating systems.
- E. Submit for review and approval manufacturer's standard Color Chart.
- F. Submit letter of verification showing VOC levels for all products to be used and verification that the VOCs meet local and/or federal limits.
- G. Submit copy of "Certificate of License" issued to the applicator from the Manufacturer.
- H. Submit for record qualification statement of the Installer stating projects, size, location, owner and contact, engineer/architect contact for projects that the membrane system has been applied.
- I. Submit for record Manufacturer's "Snow Removal Guideline" stating the procedures the Owner is to follow during snow removal from the deck coating slabs.
- J. Submit letter certifying that the aggregate to be used is approved by the manufacturer.
- K. Submit sample Warranty.
- L. Samples
  - 1. Submit for review and approval one sample representative of color, thickness and surface texture.
  - 2. Install one 10 x 10 feet field sample representative of system to be installed. Samples are to be approved by Contracting Officer. Leave sample at the jobsite during the referenced project. Use field sample to verify surface preparation, adhesion, coating thickness, application rates, aggregate type and quantity and slip resistance are acceptable prior to the start of the Project.

SECTION 07 18 16 VEHICULAR TRAFFIC COATING (VOC COMPLIANT)

1.5 QUALITY ASSURANCE

- A. Applicator
  - 1. Licensed by the manufacturer.
  - 2. Minimum 5 years experience installing specified membrane system(s).
  - 3. Minimum 5 projects similar in size and scope and coating system(s) to be used on this Project.
- B. Manufacturer
  - 1. Minimum 5 years experience in manufacturing deck coating systems.
  - 2. Must make available a qualified Manufacturer's representative to assist the Installer and Engineer. The Representative shall be experienced in the placement of deck coating systems.

1.6 DELIVERY, STORAGE & HANDLING

- A. Deliver all materials to the site in original, unopened containers bearing labels indicating material name, date of manufacture and batch number.
- B. Store materials under cover at temperatures not exceeding 90 deg F.
- C. Store drums on their side.

1.7 PROJECT CONDITIONS

- A. Install materials in accordance with all safety and weather conditions required by the manufacturer or appropriate authority.
- B. Take necessary precautions to seal off openings that will allow vapors to migrate into occupied spaces.
- C. Remove open fires and spark producing equipment from application area until vapors have dissipated.
- D. Do not apply coating if rain is expected within 6 hours of application.
- E. Do not apply coating if temperatures are expected to fall below 40 deg F during the installation or if air temperatures are above 110 deg F.
- F. Apply the system base coat to concrete in the afternoon or evening when temperatures have stabilized or are falling in order to minimize the effects of out gassing concrete.

1.8 WARRANTY

- A. Provide Owner a "Joint and Several" Warranty by manufacturer and installer that installed vehicular traffic coating system will be free of, for a period of 5 years, defects, water penetration and chemical damage related to design, workmanship or material deficiency, consisting of, but not limited to:
  - 1. Surface crazing or other weathering deficiency (including U.V. exposure).
  - 2. Abrasion or tear failure resulting from normal traffic use.
  - 3. Tear failure resulting from anticipated movement.
  - 4. Debonding from the substrate or delaminating between layers.
  - 5. Defective installation.
- B. Snowplows, vandalism, abrasive maintenance equipment and construction traffic are not normal traffic use and are exempted from Warranty.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Vehicular traffic coating system shall be fluid applied, waterproof, traffic bearing membrane capable of preventing penetration of concrete by water, gasoline, oils, greases, salts, deicer chemicals and radiator coolants.
- B. Color of system: gray as selected by Architect from manufacturer's standard colors.
- C. Specified thicknesses are minimum dry film thicknesses and do not include aggregate. Install each coat in accordance with manufacturer's recommended yield for required thickness. Prime all surfaces to be coated.

### 2.2 ACCEPTABLE MANUFACTURER

- A. LymTal International, Inc. [www.lymtal.com](http://www.lymtal.com).
  - 1. Iso-Flex 760 U L.O. (Basis of Design)
- B. Other Manufacturers: Meet requirements of Section 01 60 00 for product Substitutions.

### 2.3 MATERIALS

- A. Materials shall be VOC compliant.
- B. Base Coat: Iso-Flex 750 Base Coat.
- C. Top Coat: Iso-Flex 750 Top Coat. Color: Black.
- D. System Thickness:
  - 1. MVT – Total System Thickness – 40 dry mils
    - a. Primer
    - b. Base Coat – 25 dry mils
    - c. Top Coat – 15 dry mils
  - 2. HVT – Total System Thickness – 55 dry mils
    - a. Primer
    - b. Base Coat – 25 dry mils
    - c. Top Coat – 15 mils
    - d. Top Coat – 15 mils
- E. Deck Coating Aggregate:
  - 1. Approved aggregates for coating system shall be graded, washed and dried 16-30 mesh silica sand, 12-20 mesh silica sand, 24 mesh silicon carbide or aluminum oxide. Aggregates used depend upon which system is being used.

### 2.4 ACCESSORIES

- A. Primer: Iso-Flex 750 Primer.
- B. Recoat Primer: Iso-Flex Recoat Primer.

## PART 3 – EXECUTION

### 3.1 GENERAL

- A. Inspect surfaces to be coated. Surfaces must be free of voids, laitance, loose material, grease, oil, rust and other contaminants that will affect bond of coating. Conduct a base coat adhesion test as part of the field test to determine if surface preparation and adhesion are acceptable.
- B. Inspect slab for variations in surface finish, joint offsets, and other defects that may adversely affect performance of coating.
- C. Inspect surfaces to be coated for delaminated or damaged concrete using chain drag. Repair using approved repair materials approved by coating manufacturer.
- D. Concrete surfaces must be visibly dry and pass a 24-hour rubber mat test (no condensation) in accordance with ASTM D4263 prior to application of system.
- E. Report immediately to Architect any deficiencies in surface that render it unsuitable for proper execution of this Work. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Patch voids, honeycombs, bug holes or delaminated areas. Use only those patching materials approved by coating manufacturer.

## SECTION 07 18 16 VEHICULAR TRAFFIC COATING (VOC COMPLIANT)

- B. Clean surfaces to be coated in accordance with coating manufacturer's recommendations.
- C. Remove oil and grease with a commercial grade cleaner; thoroughly rinse and allow to dry.
- D. Prepare concrete surfaces by either shotblasting or sandblasting. Shotblasting is preferred; acid etching is unacceptable.
- E. Blow or sweep clean surfaces to be coated.
- F. Rout and seal cracks greater than 1/32 inch, or as required by coating manufacturer, using Iso-Flex 880 GB or 881.
- G. Detail cracks, coves and terminations using Iso-Flex 880 GB or 881.
- H. Detail coats shall be a minimum of 25 mils thick and extend a minimum of 2 inches onto the surrounding concrete surfaces. Detail those items described in paragraph D and E above, as well as cracks under 1/16 inch.
- I. Do not apply the deck coating system until the crack, control, construction, and cove sealants have fully cured. Sealants shall cure a minimum of 24 hours prior to installation of the primer for the deck coating.

### 3.3 INSTALLATION

- A. Install in strict accordance with manufacturer's written instructions.
- B. All coating shall maintain straight edges by using duct tape at terminations. Upon removal of duct tape, remaining deck coating shall have a straight bonded edge.
- C. Apply primer and allow to cure to a tacky-dry consistency.
- D. Apply base coat using proper notched squeegee. Coverage rates of product must be controlled using a grid pattern to distribute proper amount of coating over a given area. Back roll base coat.
- E. Allow base coat to cure for not less than 6 hours prior to proceeding to next coat. Maximum recoat time for base coat is 24 hours. If this window is missed apply Recoat Primer in accordance with manufacturer's recommendations and allow to cure for one hour, then proceed with the next coating step.
- F. For the MVT system, apply Iso-Flex 750 Top Coat using the proper notched squeegee. Control coverage rate using a grid pattern to distribute proper amount of coating over a given area. Broadcast correct amount and size of aggregate into wet coating and backroll, taking care that finished surface has acceptable slip resistance.
- G. For the HVT system, apply a coat of Iso-Flex 750 Top Coat using the proper notched squeegee. Control coverage rate using a grid pattern to distribute proper amount of coating over a given area. Broadcast correct amount and size of aggregate into wet coating and allow to cure. Apply second coat of Top Coat using the proper notched squeegee. Ensure proper distribution of coating over area. Broadcast correct amount and size of aggregate into wet coating and backroll, taking care that finished surface has acceptable slip resistance.
- H. Use Iso-Flex 750 TC AR for final top-coat on surfaces not receiving direct sunlight. Use 750 TC AL top-coat for surfaces receiving direct sunlight.
- I. Extend deck coating up vertical surfaces a minimum of 4 inches.
- J. Allow a minimum of 24 hours cure time on finish coat prior to opening to traffic.

SECTION 07 18 16 VEHICULAR TRAFFIC COATING (VOC COMPLIANT)

3.4 CLEANUP

- A. Remove all excess primer, sealant, deck coating and masking materials from Project Site and leave Project Site clean.

END OF SECTION



## SECTION 07 19 00 WATER REPELLANTS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Breathable water repellant at exposed exterior faces of brick veneer and concrete masonry.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of Product Data, Samples, and Certificates.
- C. Section 04 21 13 - BRICK MASONRY: Substrate to receive water repellant.
- D. Section 04 22 00 - CONCRETE UNIT MASONRY: Substrate to receive water repellant.
- E. Section 09 96 23 - GRAFFITI-RESISTANT COATINGS.

#### 1.3 REFERENCES

- A. ASTM C156, Standard Test Method for Water Retention by Liquid Membrane-Forming Curing Compounds for Concrete.
- B. ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials.
- C. ASTM E514, Standard Test Method for Water Penetration and Leakage Through Masonry.

#### 1.4 QUALITY ASSURANCE

- A. Use skilled workers trained and experienced in necessary crafts and familiar with requirements and methods needed for proper performance of Work of this Section.
- B. Comply with requirements of ASTM C156, ASTM E96 and ASTM E514.
- C. Applicator shall be currently approved by manufacturer, and have successfully completed minimum 3 projects of similar size, quality and complexity under present name.
- D. Manufacturer's technical representative shall make not less than 3 site visits before, during, and after application of materials, and document visits in writing.
- E. Provide materials that are VOC compliant in accordance with State of Washington Regulations.

#### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Contractor Certificate: At time of bid, submit written certification that installer has current approved applicator status with waterproofing material manufacturer.
- C. Operation and Maintenance Manual Data:
  - 1. Submit under the provisions of Section 01 78 23.
  - 2. Product Data: Submit copies of manufacturer's Specifications, installation and maintenance instructions.

#### 1.6 MOCK-UP

- A. At a location on Site approved by Architect, apply repellant to 25 sq. ft. min. that includes all surfaces scheduled to receive water repellant. Test for compatibility with substrate.
- B. Approved mock-up may be used as part of finished Work.
- C. Approved mock-up shall be used as standard for Work of this Section.

#### 1.7 PRE-APPLICATION CONFERENCE

- A. Schedule meeting not less than 7 days prior to start of application.
- B. Required Attendees:
  - 1. Contractor.
  - 2. Applicator.
  - 3. Manufacturer's technical representative.
  - 4. Architect.
  - 5. Contracting Officer.
- C. Agenda:
  - 1. Schedule.

## SECTION 07 19 00 WATER REPELLANTS

2. Site Conditions.
3. Rate of application determined by water take-up test.

### 1.8 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in manufacturer's unopened containers with all labels intact and legible at time of use. Maintain packaged materials with seals unbroken and labels intact until time of use. Protect from damage or contamination.

### 1.9 PROJECT CONDITIONS

- A. Temperature for ambient air and expose surface between 50 and 100 degrees F during application and for 24 hours thereafter.
- B. Apply only when surfaces are dry and free of frost or ice. Do not apply during inclement weather.

### 1.10 WARRANTY

- A. Manufacturer's warranty to cover: Repellant will not allow water penetration and will allow water vapor out of substrate for a period of 5 years after date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 APPROVED MANUFACTURER & PRODUCT

- A. Brick Masonry
  1. Fabrikem Manufacturing: Fabrishield 761.
  2. Huls America: Chem-Trete, BSM 40 VOC.
  3. ProSoCo: Weather Seal H40, or approved.
- B. Concrete Unit Masonry:
  1. Fabrikem Manufacturing: Fabrishield 653, or approved.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions under which Work of this Section will be performed.
- B. Verify that pointing and patching of masonry surfaces has been completed.
- C. Verify that concrete and masonry surfaces have been cured not less than 7 days before starting application.
- D. Verify that surfaces are dry, clean and free of dirt, organic coatings, oils, or stains.
- E. Correct conditions detrimental to timely and proper completion of the Work.
- F. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 PREPARATION

- A. Fill holes and cracks in mortar if required.
- B. Remove loose particles from substrates to receive water repellant.
- C. Mask off exposed surfaces adjacent to substrates to receive water repellant.
- D. Test materials to receive repellant to establish application rate.

### 3.3 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in Work of those trades for interface with Work of this Section.
- B. Protect Work of others from damage including over-spaying.

### 3.4 APPLICATION

- A. Install Work of this Section in accordance with requirements of governmental authorities having jurisdiction, and manufacturer's and referenced standards recommended installation procedures.
- B. Apply uniformly at rate recommended by manufacturer for warranty period specified for substrate receiving water repellant.
- C. Keep a wet edge at all times until complete surface plane has been sprayed.



## SECTION 07 19 00 WATER REPELLANTS

### 3.5 TESTING

- A. After water repellant has dried, test surface with water sprayed from a hose; retreat surfaces where water-absorption is detected.
- B. Final surface shall be uniform without evidence of patches or spots.

END OF SECTION



## SECTION 07 21 00 THERMAL INSULATION

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide thermal insulation in accordance with the Contract Documents.
  - 1. Thickness and insulation types are shown on Drawings.
  - 2. The scope and application of insulation is specified herein.
- B. Vapor retarder.
- C. Basis of Design: Prescriptive path from Washington State Non-Residential Energy Code.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data.
- C. Section 07 25 10 - BREATHABLE MEMBRANE: for breathable membrane at exterior walls where indicated.
- D. Section 07 84 13 - PENETRATION FIRESTOPPING: Safing insulation at slab perimeters.
- E. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: Partition sound attenuation blankets.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C578, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
  - 2. ASTM C612, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
  - 3. ASTM C665, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - 4. ASTM C666 / C666M, Standard Test Method for Resistance of Concrete Rapid Freezing and Thawing.
  - 5. ASTM D1621, Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
  - 6. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.
  - 2. International Energy Conservation Code (IECC), as amended by State of Washington.
- C. Washington State Administrative Code (WAC):
  - 1. WAC Chapter 51-11, Washington State Energy Code.

#### 1.4 QUALITY ASSURANCE

- A. Comply with the requirements of ASTM C665 as applicable, unless otherwise shown or specified:

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Manufacturer's Data: Submit manufacturer's literature, specifications and installation instructions for each type of insulation, tape, mechanical fastener and adhesive. Include certifications and laboratory test reports as may be required to show compliance with the Contract Documents.

#### 1.6 PRODUCT HANDLING

- A. Deliver insulation materials in manufacturer's unopened containers or packages, fully identified with trade name, type, class and other classifying information. Store above grade and protect from weather and damage from any source.
- B. Plastic Insulation: Protect plastic insulation from overlong exposure to sunlight and keep away from sources of heat. Do not deliver plastic insulation to Project Site before Work is ready to accept it.

## SECTION 07 21 00 THERMAL INSULATION

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Unfaced Mineral Fiber Blanket / Batt Insulation: Thermal insulation produced by combining glass mineral fibers with thermosetting resins to comply with ASTM C665 for Type I (blankets without membrane facing); widths, 16 inches to match stud spacing.
  - 1. Application: In between metal studs of exterior walls.
    - a. R-19 in walls. Where studs are not covered on both sides; provide method of restraint to keep batts from falling out on open side.
- B. Unfaced Glass Fiber Board Semi-Rigid Insulation: Low density thermal insulation produced by combining glass fibers with thermosetting resin binders to comply with ASTM C612 for Class I; nominal density of 2.25 pounds per cubic foot, k-value of 4.3 at 75 deg F, manufacturer's standard sizes. Non-combustible.
- C. Extruded Polystyrene Board Insulation: Rigid, cellular thermal insulation with closed-cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C578; with 5-year aged k-values of 5.4 and 5 at 40 and 75 deg F, respectively; minimum compressive strength of 25 pounds per square inch when tested in accordance with ASTM D1621, manufacturer's standard sizes.
- D. Wall Cavity Insulation: Non-combustible, lightweight and water repellent, semi-rigid insulation board.
  - 1. Acceptable Manufacturer: Basis of Design: CavityRock by Roxul Inc., [www.Roxul.com](http://www.Roxul.com).
  - 2. Thickness: 1 inch.
- E. Curtain Wall Insulation: Non-combustible, semi-rigid, water repellent mineral wool insulation board.
  - 1. Acceptable Manufacturer: CavityRock by Roxul Inc., [www.Roxul.com](http://www.Roxul.com).
  - 2. Thickness: 3 inches.
- F. Sprayed Insulation: Icynene; hydrophobic, low-density, open-cell modified polyisocyanurate.
  - 1. Acceptable Manufacturer: Icynene, Inc., [www.icynene.com](http://www.icynene.com).

#### 2.2 AUXILIARY MATERIALS

- A. Vapor Retarder: Scrim reinforced polyethylene or foil laminated to scrim reinforced Kraft paper; laboratory-tested vapor transmission rating of 0.05 perms. Flame spread: 0 to 25.
  - 1. Application: On inside of insulated metal stud framing and over semi-rigid insulation.
- B. Mechanical Fasteners: Zinc-coated steel or nylon fasteners consisting of an adhesively-applied perforated plate and prongs or spindles and self locking washers.
  - 1. Stc-Klip Type N by Eckel Industries of Canada, [www1.eckel.ca](http://www1.eckel.ca).
  - 2. Spindle Type by Gemco.
- C. Tape: Contractor Sheathing Tape No. 8086 by 3M, or approved, as recommended by manufacturer of insulation to be taped. Flame spread: 0 to 25.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Verify that fluid-applied vapor retarder has been properly applied to substrates to receive spray insulation.
- B. Verify that substrate to receive spray insulation is free of any foreign matter that will impede application and that other Work on and within spaces to be spray insulated are complete prior to application. Remove foreign materials, dirt, grease, oil, paint, laitance, efflorescence, and other substances that will affect application of spray insulation.
- C. Mask and protect adjacent surfaces from overspray or damage from spray insulation operations.

#### 3.2 INSTALLATION, GENERAL

- A. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

## SECTION 07 21 00 THERMAL INSULATION

- B. Apply semi-rigid unfaced insulation to concrete surfaces with mechanical fasteners as recommended by manufacturer. Where zee furring is indicated, friction fit between zeos. Cut pins 1/8 inch beyond face of board and apply self-locking cap after applying vapor retarder.
  - 1. Install fasteners at corners of boards, allowing 3 to 6 inches edge distances for boards exceeding 48 inches in length; apply additional fastener in the middle.
- C. Install batt insulation by friction fitting between studs.
- D. Install spray insulation in accordance with manufacture's written instructions and recommendations.

### 3.3 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder over all interior side of insulated exterior walls from lowest insulated walls to underside of roof decking. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loose fiber-type insulation. Extend vapor retarder behind exterior columns to maintain continuity.
- B. Seal overlapping joints in vapor retarders with adhesives or tape per vapor retarder manufacturer's printed directions. Seal butt joints and fastener penetrations with tape. Locate all joints over framing members or other solid substrates. Firmly attach vapor retarders to framing with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.
- C. Seal joints caused by pipes, conduits, structural braces, electrical boxes and similar items penetrating vapor retarders with tape to create an air-tight seal between penetrating objects and vapor retarder.
- D. Repair any tears or punctures in vapor retarders immediately before concealment by other Work. Cover with tape or another layer of vapor retarder.

### 3.4 SCHEDULE OF THERMAL INSULATION PRODUCTS

SCHEDULE OF THERMAL INSULATION PRODUCTS		
Tag	Type	Where Required
INS-1	Unfaced Mineral Fiber Blanket/Batt	Stud cavities of exterior walls.
INS-2	Unfaced Glass Fiber Board Semi-Rigid	Mechanically attached to exterior concrete walls, precast concrete, concrete curbs, metal wall panels, steel window wall supports.
INS-3	Extruded Polystyrene Board	Under concrete slab-on-grade at building perimeter. Back side of below-grade stem walls. At elevated plaza areas and planter areas. Apply 100 pcf product at plaza and planter areas. Apply 25 pcf product at all other locations.
INS-4	Wall Cavity Insulation	At exterior surface of glas-mat gypsum sheathing. Wall cavities at veneer masonry.
INS-5	Curtain Wall Insulation	At spandrel glazing. At composite wall panels.
INS-6	Spray-Applied	At inboard face of precast concrete elements.
[---]	Board Roof Insulation	As specified in roofing Sections.

END OF SECTION



## SECTION 07 25 10 BREATHABLE MEMBRANE

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Exterior wall, breathable membrane.

#### 1.2 RELATED SECTIONS

- A. Section 09 21 00 – GYPSUM BOARD ASSEMBLIES: for gypsum sheathing substrate to receive breathable membrane.

#### 1.3 REFERENCES

- A. American Association of Textile Chemists and Colorists (AATCC).
- B. American Society for Testing and Materials (ASTM).
- C. International Code Council Acceptance Criteria (ICC-ES-AC).

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Manufacturer's Instructions: Provide manufacturer's instructions showing the recommended procedures and sequence of installation of breathable membrane in Rain screen installations.

#### 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain all breathable membranes through one source from a single manufacturer.

#### 1.6 MOCK-UP

- A. Provide sequential mock-up with related Sections, including integration with adjacent building systems.

#### 1.7 DELIVERY, STORAGE & HANDLING

- A. Deliver materials to project site in original containers with seals unbroken, wrapped in a polythene sleeve, labeled with manufacturer's name, and product brand name.
- B. Store rolls under cover, on a clean, level surface, either flat or upright.

#### 1.8 PRE-INSTALLATION CONFERENCE

- A. Prior to commencement of Work, conduct conference at Project Site under the provisions of Section 01 31 19.
  - 1. Required Attendance: Contractor's site superintendent, installer, product manufacturer's field representative, building envelope consultant, independent inspector, and architect.
  - 2. Review requirements for membrane, including surface preparation specified under other Sections, substrate condition and pretreatment, temporary weather protection, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

### PART 2 – PRODUCTS

#### 2.1 APPROVED MANUFACTURERS & PRODUCTS

- A. VaproShield LLC, [www.VaproShield.com](http://www.VaproShield.com).
  - 1. WallShield spun bonded polypropylene: Furnish in standard rolls of 59 inch high and 164 feet long.
  - 2. Approved Substitutions. Note: Architect is not aware of other materials having both water resistance and perm rating of specified product.

#### 2.2 MEMBRANE PHYSICAL PROPERTIES

- A. Color: Green on exterior, White on interior of membrane.
- B. Thickness and Weight: 0.023 inches thick and 5.161 oz. / sq. yd.
- C. Tensile strength: ASTM D882, Pass.

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- D. Water Resistance (control and weathered specimens): AATCC-127, Pass.
- E. Water Vapor Transmission: ASTM E96, Pass.
- F. Low Temperature Bend: AC38, Pass.
- G. Flamespread Index: ASTM E84, Pass.
- H. Smoke Development Index: ASTM E84, Pass.

### 2.3 AUXILIARY MATERIALS

- A. Membrane Flashing.
  - 1. Flashing Rolls: VaproFlashing. Orange color.
  - 2. Factory-Formed Corners:
    - a. VaproFlashing Factory Formed Corners 18x18 inches.
    - b. At Contractor's option: field-fabricated corners as installed on approved mock-up.
- B. Tape:
  - 1. Single-Sided Tape: 3 inch VaproTape (Single-Sided) 20 mil., for use to secure membrane to itself and to substrates.
    - a. Approved Substitutions.
  - 2. Double-Sided Sealing Tape:
    - a. 1 inch VaproTape (Double-Sided) 30 mil., for use to seal membrane to itself and to substrates.
    - b. One inch wide butyl rubber tape, subject to approval of Architect.
    - c. Approved Substitutions.
- C. Caulks & Sealant: As approved and recommended by membrane manufacturer.
- D. Fasteners
  - 1. Exterior Gypsum Sheathing Substrate:
    - a. Minimum No. 12-gauge [0.0129-inch-shank-diameter] stainless steel nails having a minimum 3/8 inch diameter head.
    - b. No. 14-gauge [0.083-inch-shank-diameter] steel nails having a 1-inch diameter head.
    - c. Minimum No. 16-gauge [0.065-inch-leg-diameter] stainless steel staples having minimum 7/16 inch crowns.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions with installer present, for compliance with requirements and other conditions affecting performance.

### 3.2 SURFACE PREPARATION

- A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean and dry substrate for breathable membrane application.

### 3.3 PENETRATIONS

- A. Pipes and Conduit: Install manufactured penetration sleeves sized for the penetration and installed as recommended by the manufacturer.
- B. Windows:
  - 1. Prepare corners at window sill ends.
  - 2. Next, lay strip of breathable membrane across sill. Secure with tape or mechanical fasteners so that the membrane used for the wall can be slipped underneath the corners and sill, allowing for a minimum lap of 6 inches.
  - 3. Wrap a strip of breathable membrane around jambs extending horizontally along walls a minimum of 9 inches.
  - 4. Prepare corners of opening at ends of window head.
  - 5. Next, lay strip of breathable membrane across the opening, extending horizontally beyond the corners a minimum of 6 inches.
    - a. Cut membrane along the leading edge of the header an inch or two beyond each jamb, so that the nailing flange of the window may side up behind the membrane.



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- C. Doors:
1. Wrap a strip of breathable membrane around jambs, extending horizontally along walls a minimum of 9 inches.
    - a. Prepare corners of opening at ends of door head.
    - b. Next, lay strip of breathable membrane across the opening, extending horizontally beyond the corners a minimum of 6 inches.
    - c. Cut membrane along the leading edge of the header, an inch or two beyond each jamb, so that the nailing flange of the door may side up behind the membrane.

### 3.4 BREATHABLE UNDERLAYMENT APPLICATION

- A. Install membranes in accordance with manufacturer's instructions over exterior gypsum sheathing.
1. First, wrap penetrations as specified and detailed.
  2. Next, starting from bottom, unroll membrane, green side out mechanically fastening top and bottom at 24 inch centers.
  3. Seal against jambs of openings with 1 inch VaproTape (Double-Sided).
  4. Vertical laps shall be a minimum of 6 inches with taped joints or 12 inches without tape. Horizontal laps shall be a minimum of 6 inches.

### 3.5 INSTALLATION INSTRUCTIONS

- A. Step 1 – Begin Flashing Penetrations:
1. Cut a piece of breathable membrane to act as a "skirt" around counter flashed penetrations. i.e. Ducts/housings or pipes. Distance from penetration to edge of barrier "skirt" minimum of 12 inches.
  2. Make four cuts to form a star shape and place over penetration snugly.
  3. Extend "ears" of material along vertical penetration and seal with VaproTape (Single-Sided).
  4. Tape top edge of "skirt" to wall using VaproTape (Single-Sided). Do not tape bottom edge.
- B. Step 2 – Attach Breathable Membrane:
1. Starting at base of wall, unroll breathable membrane horizontally across wall. Best practice: place a continuous bead of non-skinning butyl sealant or butyl tape on foundation wall and seal breathable membrane to it.
  2. Extend 6 inches over starting corner.
  3. Fasten at top and bottom of roll at 2 inches from edge of breathable membrane to center of fasteners.
  4. Fasten at maximum of 24-inch centers.
  5. Shingle next layers of breathable membrane, ensuring minimum 6 inches horizontal and minimum 12 inches vertical laps. Ensure minimum 6 inches horizontal and minimum 6 inches vertical laps if taped with VaproTape (Single-Sided) at vertical laps. Do not place vertical laps above windows.
  6. For delayed installation of siding/masonry determine fasteners and reduced fastener spacing for wind exposure (i.e. cap nails).
- C. Step 3 – Finish Flashing Penetrations:
1. Ensure breathable membrane is slipped under bottom edge of penetration "skirt" and shingled over taped top edge.
  2. Seal top and sides with VaproTape (Double-Sided).
  3. Ensure whole "skirt" assembly is flashed appropriately with metal.
- D. Step 4 – Install Masonry Veneer:
1. Masonry – wall ties/mechanical fasteners/veneer anchors as per Building Code requirements.
- E. High Rise Applications:
1. For installation instructions for high-rise applications, contact membrane manufacturer for recommendations.

### 3.6 FIELD QUALITY CONTROL

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- A. Owner will engage an independent inspector to observe substrate and installation. Inspector shall provide a written, sign-off log, on all penetrations before the membrane is placed against them. Form of log shall be approved by Architect before Contract with inspection service is approved.

### 3.7 PROTECTING & CLEANING

- A. Protect installed breathable membrane from damage due to ultraviolet light, harmful weather exposures, physical abuse, and other causes.
  - 1. Manufacturer suggests a maximum of 9 months UV exposure.
  - 2. Repair torn breathable membrane by inserting a full height piece of membrane extending 12 inches horizontally beyond the damage and extend up and under the membrane above. Mechanically attach membrane to substrate top and bottom.
- B. Remove mud and similar marks with a water only scrub. If chemicals have been spilled on membrane, treat as a tear and repair as specified under Subparagraph 3.7.A.2 of this Section.

END OF SECTION

## SECTION 07 41 13 METAL ROOF PANELS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Standing-seam metal roof panels.
- B. Rigid Insulation.
- C. Underlayment.
- D. Accessories.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- A. Section 05 31 00 - METAL DECKING: for steel roof deck supporting metal roof panels.
- B. Section 07 62 00 - SHEET METAL FLASHING & TRIM: for field-formed roof drainage systems and other sheet metal work not part of metal roof panel assemblies.

#### 1.3 DEFINITIONS

- A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight roofing system.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design: Design metal roof panel assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at the following test-pressure difference:
  - 1. Test-Pressure Difference: Negative 1.57 lbf/sq. ft.
  - 2. Test-Pressure Difference: Positive and negative 1.57 lbf/sq. ft.
  - 3. Positive Preload Test-Pressure Difference: Greater than or equal to 15.0 lbf/sq. ft. and the greater of 75 percent of building live load or 50 percent of building design positive wind-pressure difference.
  - 4. Negative Preload Test-Pressure Difference: 50 percent of design wind-uplift-pressure difference.
- D. Water Penetration: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 2.86 lbf/sq. ft..
  - 2. Test-Pressure Difference: 20 percent of positive design wind pressure, but not less than 6.24 lbf/sq. ft. and not more than 12.0 lbf/sq. ft..
  - 3. Positive Preload Test-Pressure Difference: Greater than or equal to 15.0 lbf/sq. ft. and the greater of 75 percent of building live load or 50 percent of building design positive wind-pressure difference.
  - 4. Negative Preload Test-Pressure Difference: 50 percent of design wind-uplift-pressure difference.
- E. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140.
- F. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
  - 1. Uplift Rating: UL 90.
- G. FMG Listing: Provide metal roof panels and component materials that comply with requirements in FMG 4471 as part of a panel roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
  - 1. Fire/Windstorm Classification: Class 1A-60.
  - 2. Hail Resistance: MH.

## SECTION 07 41 13 METAL ROOF PANELS

- H. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
  - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
    - a. Uniform pressure of 30 lbf/sq. ft., acting inward or outward.
- I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.
- C. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, side-seam joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
  - 1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
    - a. Flashing and trim.
- D. Samples for Initial Selection: For each type of metal roof panel indicated with factory-applied color finishes.
  - 1. Include similar Samples of trim and accessories involving color selection.
- E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
  - 1. Metal Roof Panels: 12 inches long by actual panel width. Include fasteners, clips, closures, and other metal roof panel accessories.
  - 2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
  - 3. Accessories: 12-inch-long Samples for each type of accessory.
- F. Coordination Drawings: Roof plans, drawn to scale, on which the following are shown and coordinated with each other, based on input from installers of the items involved:
  - 1. Roof panels and attachments.
- G. Qualification Data: For qualified Installer.
- H. Material Certificates: For thermal insulation, from manufacturer.
- I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- J. Field quality-control reports.
- K. Maintenance Data: For metal roof panels to include in maintenance manuals.
- L. Warranties: Samples of special warranties.

### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- C. Source Limitations: Obtain each type of metal roof panels from single source from single manufacturer.
- D. Fire-Resistance Ratings: Where indicated, provide metal roof panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
  - 2. Combustion Characteristics: ASTM E 136.

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- E. Preinstallation Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, metal roof panel Installer, metal roof panel manufacturer's representative, Installer, and installers whose work interfaces with or affects metal roof panels including installers of roof accessories and roof-mounted equipment.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Review methods and procedures related to metal roof panel installation, including manufacturer's written instructions.
  - 4. Review structural loading limitations of deck during and after roofing.
  - 5. Review flashings, special roof details, roof drainage, roof penetrations, and condition of other construction that will affect metal roof panels.
  - 6. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
  - 7. Review temporary protection requirements for metal roof panel assembly during and after installation.
- 8. Review roof observation and repair procedures after metal roof panel installation.
- 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

### 1.7 DELIVERY, STORAGE, & HANDLING

- A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.
- E. Protect foam-plastic insulation as follows:
  - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  - 2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
  - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

### 1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

### 1.9 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of decks, parapets, walls, and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.

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### 1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including rupturing, cracking, or puncturing.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- C. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
  - 2. Surface: Smooth, flat finish.
  - 3. Exposed Coil-Coated Finish:
    - a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - b. Color as scheduled in Section 09 06 09.
- B. Panel Sealants:
  - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
  - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
  - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

### 2.2 RIGID INSULATION

- A. Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1 or 2 felt or glass-fiber mat, Grade 3, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core.

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- B. Insulation Fasteners: Locking high strength polypropylene or Zinc/Aluminum plates with corrosion resistant fluorocarbon coated screws of sufficient length to penetrate the underside of the metal deck a minimum of ¼ -inch.
  - 1. 2-inch diameter, corrosion resistant metal plates as manufactured and / or recommended by roofing materials manufacturer.
  - 2. Or Approved Equal.

### 2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: 40 mils thick minimum, consisting of slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
  - 1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
  - 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
  - 3. Products: Subject to compliance with requirements, provide one of the following:
    - a. Carlisle Coatings & Waterproofing Inc., Div. of Carlisle Companies Inc.; CCW WIP 300HT.
    - b. Grace Construction Products; a unit of Grace, W. R. & Co.; Ultra.
    - c. Henry Company; Blueskin PE200 HT.
    - d. Owens Corning; WeatherLock Metal High Temperature Underlayment.
    - e. Or Approved Equal.
- B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.
- C. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

### 2.4 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

### 2.5 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
  - 1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
- B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels, and snapping panels together.
  - 1. Upon Architects approval provide one of the following:
    - a. intermediate stiffening ribs symmetrically spaced between ribs.
    - b. Flat pan between ribs.
  - 2. Available Manufacturers:
    - a. Custom-Bilt Metals.
    - b. Metal-Fab Manufacturing, LLC.
    - c. Or Approved Equal.
  - 3. Material: 24 gauge pre-finished sheet metal.
  - 4. Color: As selected by Architect from manufacturer's full range.
  - 5. Clips: Floating to accommodate thermal movement.

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- a. Material: zinc-coated (galvanized) steel sheet, size as recommended by the manufacturer.
6. Standing Seam Height: 1-1/2 to 2 inches.
7. Joint Type: Single folded.
8. Panel Coverage: 12 inches.

### 2.6 ACCESSORIES

- A. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
  1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
  2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
  3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B. Flashing and Trim: Formed from same material as roof panels, prepainted with coil coating, minimum 24 gauge thick. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.
- C. Internal Gutter and Downspouts: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim".

### 2.7 FABRICATION

- A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
  1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
  2. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
  3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
  4. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's "Architectural Sheet Metal Manual" or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

### 2.8 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.



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- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.
- B. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
- C. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
- B. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.

#### 3.3 RIGID INSULATION INSTALLATION

- A. Apply insulation units in accordance with manufacturer's current published installation instructions, and these contract documents.
- B. Insulation boards that are wet, warped, or buckled shall not be installed, and must be discarded.
- C. Insulation boards that are broken, cracked, or crushed shall not be installed unless the damaged area is first removed and discarded.
- D. Insulation boards that become wet or damaged after installation must be removed and replaced.
- E. Install no more insulation than can be properly covered by the end of each day with self-adhering underlayment.
- F. Install two or more layers of insulation under area of roofing to achieve required thickness. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- G. Install insulation units with long joints in continuous straight lines, perpendicular to roof slopes, or as indicated by the manufacturer, with end joints staggered between rows. Tightly butt insulation units together.
- H. Joints of insulation units shall be butted tight; leave no more than 1/8 inch gap between abutting boards, maximum. Joints exceeding 1/8 inch shall be infilled with insulation.
- I. Fasten insulation assembly to substrates according to recommendations in FMG's "Approval Guide" for specified Windstorm Resistance Classification. Minimum requirements.
  - 1. Provide 1 fastener for every 2 square foot of board.
  - 2. Increase fastener pattern by 100 percent at the first 4 feet of roof perimeters and at the first 8 feet from building corners.
- J. Install fasteners such that the fastener plate is pulled tight and flush to the surface of the insulation assembly. Fasteners that do not engage the substrate properly shall be removed and replaced.
- K. Install additional fasteners at edges of insulation assembly that do not align properly in an effort to provide a smooth and flush substrate for new roofing materials.
- L. Furring Channel Installation:

## SECTION 07 41 13 METAL ROOF PANELS

1. Where required by the manufacturer of the roofing system for roof system securement, install furring channels across plane of roof, per manufacturer's installation instructions.
  2. Furring channels shall be installed with spacing as recommended by manufacturer to achieve the wind uplift requirements specified within this section.
  3. Secure furring channels into place with self-drilling screws placed no less than 16-inches on center at both sides of hat channels, or along one side of z-purlins.
  4. Insulate voids within hat channels prior to installation.
- M. Board Insulation: Extend insulation in thickness indicated to cover entire roof.
1. Erect insulation and hold in place with Z-shaped furring members spaced 24 inches o.c. Securely attach narrow flanges of furring members to roof deck with screws spaced 24 inches o.c.

### 3.4 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated on Drawings, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
- B. Felt Underlayment: Apply at locations indicated on Drawings, in shingle fashion to shed water, and with lapped joints of not less than 2 inches.
- C. Apply slip sheet over underlayment before installing metal roof panels.
- D. Install flashings to cover underlayment to comply with requirements specified in Division 07 Section "Sheet Metal Flashing and Trim."

### 3.5 METAL ROOF PANEL INSTALLATION, GENERAL

- A. Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
- B. Thermal Movement: Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.
  1. Point of Fixity: Fasten each panel along a single line of fixing located at ridge.
  2. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.
- C. Install metal roof panels as follows:
  1. Commence metal roof panel installation and install minimum of 100 SF in presence of factory-authorized representative.
  2. Field cutting of metal panels by torch is not permitted.
  3. Locate and space fastenings in uniform vertical and horizontal alignment.
  4. Provide metal closures at rake walls and each side of hip caps.
  5. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
  6. Install hip caps as metal roof panel work proceeds.
  7. Install metal flashing to allow moisture to run over and off metal roof panels.
- D. Fasteners:
  1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.
- E. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- F. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
  1. Coat back side of roof panels with bituminous coating where roof panels will contact wood, ferrous metal, or cementitious construction.

## SECTION 07 41 13 METAL ROOF PANELS

- G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.

1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.

### 3.6 METAL ROOF PANEL INSTALLATION

- A. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.

### 3.7 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

- C. Internal Gutters and Downspouts: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim".

### 3.8 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal roofing within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

### 3.9 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.
- C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

## SECTION 07 41 13 METAL ROOF PANELS

### 3.10 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

## SECTION 07 42 43 COMPOSITE WALL PANELS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Aluminum composite building panels as indicated in the Contract Documents.
- B. Extruded aluminum framing accessories, subgirts, stiffeners, and splines.
- C. Gasketed dry-joint panel system.
- D. All accessories necessary for complete weather-tight exterior skin system.
- E. Deferred Submittal by Contractor.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Deferred Submittal procedures.
- C. Section 01 33 12 - COORDINATED SUBMITTAL REQUIREMENTS: Submittals of this Section are affected by coordinated simultaneous submittal requirements.
- D. Section 08 44 12 - ALUMINUM CURTAIN WALLS - DESIGN & PERFORMANCE: for design requirements.
- E. Section 09 06 09 - EXTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.

#### 1.3 REFERENCES

- A. Aluminum Association (AA):
  - 1. AA-C22-A41: Clear Coatings.
  - 2. AA-C22-A42: Integral Color Coatings.
- B. ASTM International (ASTM):
  - 1. ASTM B137: Test Method for Measurement of Coating Mass Per Unit Area of Anodically Coated Aluminum.
  - 2. ASTM B209: Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

#### 1.4 DESIGN REQUIREMENTS

- A. Design panels with maximum allowable deflection of support members not exceeding L/180 of the unsupported span when exposed to wind load of **[insert]** and/or the Building Code in effect.
- B. Panel support system shall allow for free-floating panel installation and complete secondary guttering, draining to the exterior at horizontal joints.
- C. Design the system to effect a positive mechanically fastened assembly to substructure, not dependent on adhesives.
- D. Gasketed joints shall allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture.
- E. Manufacture, installation, and sealing shall prevent deformation of exposed surfaces.
- F. Design panel system to accommodate substructure tolerance of +0 to -1/8 inch.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum of 5 years experience in manufacturing panels similar to those specified.
- B. Installer Qualifications: Acceptable to panel manufacturer.

#### 1.6 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Manufacturer's product literature for the panel specified.
- C. Shop Drawings: Indicate thickness and dimension of parts, fastening and anchoring methods, and detail and location of joints and gaskets; including joints necessary to accommodate thermal movement.

#### 1.7 DELIVERY, STORAGE & HANDLING

- A. Deliver materials to the project site in manufacturer's original crating, properly labeled for identification and installation purposes. Store materials in accordance with panel manufacturer's recommendations. Handle materials carefully to avoid damage to panels and finishes.

## SECTION 07 42 43 COMPOSITE WALL PANELS

### 1.8 WARRANTY

- A. The Contractor shall warrant the materials to be free of faults and defects in accordance with the General Conditions, except that the warranty shall be extended by paint manufacturer's standard multi-year warranty. The warranty shall be in writing and shall be signed by the manufacturer.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Approved Manufacturer: Una-Clad by Copper Sales, Inc. is Basis of Design. Other manufacturers submit Substitution under the provisions of Section 01 60 00 prior to bidding.

### 2.2 PANELS

- A. Type: Composite Panel System Series 1500.
- B. Thickness: 6 mm.
- C. Finish: Hylar 5000/Kynar 500. Color as scheduled in Section 09 06 10.

### 2.3 ACCESSORIES

- A. Perimeter Framing, Subgirts, Splines, and Gutters: Manufacturer's standard extruded aluminum components.
- B. Gaskets: Extruded neoprene.
- C. Fasteners: As recommended by panel manufacturer.
- D. Butyl tapes and sealants.

### 2.4 MATERIALS AND FABRICATION

- A. Composite Panel: Extruded thermoplastic core faced with 2 sheets of ASTM B209, 0.020 inch thick aluminum. Skins are bonded to core in a continuous process, free of glues and adhesives.
  - 1. Thickness [4mm] [6mm].

### 2.5 ACCESSORIES

- A. Perimeter Framing, Subgirts, Splines, and Gutters: Extruded Aluminum.
  - 1. Alloy 6063-T5 for perimeter framing.
  - 2. Alloy 6061-T6 for subgirts and stiffeners.
- B. Gaskets: Extruded neoprene.
- C. Fasteners: As recommended by the panel manufacturer.

### 2.6 FINISHES

- A. Spray-Applied Fluorocarbon Resin: Hylar 5000/Kynar 500.
  - 1. Color: As scheduled in Section 09 06 10.
  - 2. Number of Coats: [2-coats][3-coats][4-coats].
  - 3. Provide factory applied strippable plastic film for protection during fabrication and installation.
- B. Coil-Coated Fluorocarbon Resin: Hylar 5000/Kynar 500.
  - 1. Color: As scheduled in Section 09 06 10.
  - 2. Number of Coats: [2-coats][3-coats][4-coats].
  - 3. Provide factory applied strippable plastic film for protection during fabrication and installation.
- C. Coil Anodized Finish.
- D. Batch Anodized Finish.
  - 1. Color: As scheduled in Section 09 06 10.
  - 2. Film Thickness: Test Method ASTM B137; by weight.
    - a. Class I, 0.7 mils (minimum).
    - b. Class II, 0.25 (minimum) to 0.7 mils.
  - 3. Provide factory applied strippable plastic film for protection during fabrication and installation.

## SECTION 07 42 43 COMPOSITE WALL PANELS

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and conditions under which materials are to be installed and notify the Contractor in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.
- B. Surfaces to receive panels shall be even, smooth, sound, clean, dry, and free from defects.

#### 3.2 PREPARATION

- A. Obtain field measurements prior to completion of manufacturing and finishing. When field measurements are not possible, provide method of installation which will allow minor adjustment in the field.

#### 3.3 INSTALLATION

- A. Erect panels plumb, level, and true.
- B. Anchor panels securely in place, in accordance with final approved shop drawings.
- C. Comply with panel manufacturer's instructions for installation of concealed fasteners.
- D. Maximum deviation from vertical-horizontal alignment of installed panels shall be 1/4 inch in 20 feet.

#### 3.4 ADJUSTING & CLEANING

- A. Repair panels with minor damage.
- B. Remove panels damaged beyond repair and replace with new panels to match adjacent undamaged panels.
- C. Clean exposed panel surfaces promptly after installation in accordance with recommendations of panel and coating manufacturers.
- D. Remove protective film immediately after installation.

END OF SECTION





## SECTION 07 50 02 MODIFICATIONS TO EXISTING MEMBRANE ROOFING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Modifying existing membrane roofing at new penetrations and repair of existing membrane roofing.
- B. Submittals.
- C. Warranty.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES.
- C. Section 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY: Miscellaneous pressure-treated wood framing and blocking at roof penetrations, roofing terminations, and curbs for mechanical equipment.
- D. Section 07 62 00 - SHEET METAL FLASHINGS & TRIM: Sheet metal flashings and trim.

#### 1.3 REFERENCES

- A. National Roofing Contractors Association
  - 1. The NRCA Roofing Manual: Membrane Roof Systems.
- B. Primary Roofing Materials Manufacturer
  - 1. Printed Installation Instructions and Details.

#### 1.4 QUALITY ASSURANCE

- A. Install matching roof system components by same manufacturer as existing roofing system such that new Work will not void current warranty of existing roofing system.
- B. Installer: A firm which is approved or licensed by manufacturer of primary roofing materials.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Existing Roofing Data Sheet: Submit completed Form to Architect at Project Preconstruction Meeting.
- C. Inspection Report: Copy of roofing system manufacturer's Inspection Report of completed roofing installation.

#### 1.6 WARRANTY

- A. Manufacturer's Warranty: Upon successful completion of the Work to the manufacturer's satisfaction and receipt of Final Payment, letter from manufacturer stating specifically that completed Work is installed in accordance with manufacturer's recommendations and that the Work does not adversely affect the Warranty of the existing roofing installation.
- B. Installer Warranty: The Installer shall supply the Owner with a separate five (5) year workmanship warranty. In the event any Work related to roofing, flashing or metal is found to be within the warranty term, defective or otherwise not in accordance with the Contract Documents, the Installer shall repair that defect at no cost to the Owner. The Installer's warranty obligation shall run directly to the Owner, and a copy shall be sent to the manufacturer.
- C. Adhesion Warranty: Provide a ten (10) year adhesive manufacturer's labor and material warranty, countersigned by the Installer, agreeing to remove and replace damaged portions of the roof which resulted solely from failure of adhesion of the roof insulation.
- D. Owner Responsibility: Owner shall notify the primary roofing manufacturer and the Installer of any leaks as they occur during the time period when both manufacturer's and Installer's warranties are in effect.

#### 1.7 PROJECT CONDITIONS

- A. Weather: Proceed with roofing Work when existing and forecasted weather conditions permit Work to be performed in accordance with manufacturer's recommendations and Warranty requirements.

## SECTION 07 50 02 MODIFICATIONS TO EXISTING MEMBRANE ROOFING

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Roofing System Products: Match system component products by same manufacturer as existing roofing system.

#### 2.2 MISCELLANEOUS MATERIALS

- A. Acceptable to primary roofing materials manufacturer.

### PART 3 - EXECUTION

#### 3.1 PREPARATION OF SUBSTRATE

- A. General: Comply with manufacturer's instructions for preparation of substrate to receive roof insulation and membrane roofing system. Do not proceed with installation until drains, roof structures, vents and sleeves for piping penetrations and other projections through the roof deck have been installed.
- B. Clean substrate of dust, debris and other substances detrimental to roofing system Work. Remove sharp projections.

#### 3.2 INSTALLATION OF ROOFING

- A. General: Comply in strict accordance with manufacturer's repair and installation instructions and guide Specification.

#### 3.3 COMPLETION

- A. Prior to demobilization from the Site, the Work shall be reviewed by the Contracting Officer and the Installer. All defects and non-compliance with the Specifications or the recommendations of the primary roofing material manufacturer shall be itemized in a Punch List. These items must be corrected immediately by the Installer to the satisfaction of the Contracting Officer prior to demobilization.

END OF SECTION

## SECTION 07 50 02 MODIFICATIONS TO EXISTING MEMBRANE ROOFING

## SECTION 07 50 00

## EXISTING ROOFING DATA SHEET

## 1.1 PROJECT DATA

Project Title:	
Project Address:	
Architect's Project No.:	

## 1.2 EXISTING WARRANTY DATA

Name of Primary Roofing Materials Manufacturer:	
Name of Primary Roofing Materials Installer:	
Date Warranty Commenced for Current Roof Installation:	
Length of Warranty Period (years):	

## 1.3 EXISTING ROOFING PRODUCT DATA

Description	Manufacturer's Product
Vapor Barrier (if applicable)	
Thermal Insulation and Method of Attachment to Substrate	
Membrane Components (list all)	

## 1.4 ATTACHMENTS

- A. Attach copies of the following:
1. Product Data sheets for all roofing system component products.

Note: Obtain data for this Form from Owner's Operation & Maintenance Manuals.



## PART 1 - GENERAL

## 1.1 SECTION INCLUDES

- A. Provide modified bitumen membrane roofing in accordance with the Contract Documents.
- B. Work Included:
  - 1. Cold adhesive and torch applied 2-ply SBS modified bitumen built-up roofing system, with aluminum-faced SBS modified bitumen flashing sheet.
  - 2. Rigid insulation and cover board assemblies – both flat stock and tapered.

## 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- A. Section 03 30 00 - CAST-IN-PLACE CONCRETE: for concrete substrate.
- B. Section 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY: for pressure treated wood blocking.
- C. Section 07 62 00 - SHEET METAL FLASHINGS & TRIM: for sheet metal flashings, copings and seismic joint materials.

## 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C728, Standard Specification for Perlite Thermal Insulation Board.
  - 2. ASTM 41, Standard Specification for Asphalt Primer Used for Roofing, Dampproofing, and Waterproofing.
  - 3. ASTM D312, Standard Specification for Asphalt Used in Roofing.
  - 4. ASTM D3617, Standard Specification for Sampling and Analysis of Built-Up Roof Systems During Application.
  - 5. ASTM 4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- B. FM Global (FM):
  - 1. FM 4470, Approval Standard for Class 1 Roof Covers.
- C. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.
  - 2. International Energy Conservation Code (IECC), as amended by State of Washington.
- D. National (NRCA):
  - 1. ARMA/NRCA Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing.
  - 2. Roofing and Waterproofing Manual"
- E. Roofing Terminology:
  - 1. Refer to ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing Work in this Section.
- F. Washington State Administrative Code (WAC):
  - 1. WAC Chapter 51-11, Washington State Energy Code.

## 1.4 QUALITY ASSURANCE

- A. Manufacturer: Soprema, Inc., shall be the primary roofing manufacturer and their products are the basis of this Specification. No Substitutions.
  - 1. Manufacturer shall have qualified regional technical representative who will come to Project Site for purposes of advising Installer and perform inspections as required for warranty.
  - 2. The manufacturer's guide specification is adopted by reference.
  - 3. Obtain primary products, including each type of roofing ply sheet, bitumen, and adhesive, membrane flashings from a single manufacturer, or with primary manufacturer's endorsement. Provide secondary products as recommended and approved by the primary manufacturer for the specified roof systems.
  - 4. A technical representative of materials manufacturer shall periodically observe work in progress.

## SECTION 07 52 00 MODIFIED BITUMEN MEMBRANE ROOFING

- B. Installer: Installer Qualifications and Requirements:
  - 1. A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
  - 2. In continuous business under same name for past 3 years.
  - 3. Completed at least 3 successful installations of specified materials and systems on projects of similar scope.
  - 4. Contractor shall provide all personnel trained in application of materials and systems and shall maintain supervision as specified elsewhere.
  - 5. Installer Field Supervision: Require Installer to maintain full-time supervisor / foreman on job site during times that modified bituminous roofing systems installation is in progress, and who is experienced in installation of specified roofing systems.
  - 6. Technical representative, as a minimum, shall be present to observe deck preparation, general installation procedures, and final completion; submit documentation of manufacturer's final acceptance. Work shall not proceed until such observations have been made and conditions have been approved in writing by manufacturer.
  - 7. Technical representative shall perform a punch list inspection upon Project Substantial Completion indicating all items in need of attention, including conformance to manufacturer's written installation instructions and these Contract Documents; provide documentation.
  - 8. Work shall not proceed until such observations have been made and conditions have been approved in writing by the manufacturer.
- C. UL Listing: Class A rated roofing assembly.
- D. FM Global Requirements:
  - 1. Wind Category: Class I-60: Roof systems shall be attached to resist twice the following uplift pressures (safety factor of two):
    - a. 40 pounds per square foot within 10 foot perimeter.
    - b. 25 pounds per square foot for balance of roofs.
  - 2. Class I assembly, noncombustible.
- E. Roof details and installation shall be reviewed and approved by FM Global. Submit one (1) copy of roofing Submittals and schedule inspection with FM Global, 601 - 108th Avenue NE, Suite 1400, P.O. Box 96077, Bellevue, WA 98004, telephone (425) 455-5333, fax (425) 454-7847.

### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit Specifications, installation instructions and general recommendations from manufacturers of membrane roofing system materials, insulation and insulation adhesive. Include data substantiating that materials comply with Specification requirements and compatibility. Include installation details for accessory materials.
- C. Shop Drawings: Submit manufacturer's standard details as applicable to this Project and special details that are required by Project design and which are approved by primary roofing materials manufacturer. Details shall be referenced to specific locations on the Roof Plan. Indicate all conflicts where manufacturer objects to details on Contract Documents.
- D. Specimen copies of specified warranties.
- E. Inspection Report: Copy of roofing system manufacturer's Inspection Report of completed roofing installation.

### 1.6 PROJECT / SITE CONDITIONS

- A. Weather: Proceed with roofing Work when existing and forecasted weather conditions permit Work to be performed in accordance with manufacturer's recommendations and warranty requirements.

1.7 PRODUCT HANDLING

- A. Handle and store material and equipment in a manner that avoids concentrated loads on roof surface or installed insulation that might cause permanent deformation.
  - 1. Deliver roofing materials to Project Site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
  - 2. Do not leave unused insulation, felts, and other sheet materials on roof overnight or when roofing work is not in progress unless protected from weather or other moisture sources.

1.8 WARRANTIES

- A. Manufacturer's Warranty: Upon successful completion of the Work to manufacturer's satisfaction and receipt of Final Payment, the manufacturer's standard 15-year warranty shall be issued.
- B. Installer Warranty: The Installer shall supply the Owner with a separate 5-year workmanship warranty. In the event any Work related to roofing, flashing or metal is found to be within the warranty term, defective or otherwise not in accordance with the Contract Documents, Installer shall repair that defect at no cost to Owner. The Installer's warranty obligation shall run directly to the Owner, and a copy shall be sent to the manufacturer.
- C. Adhesion Warranty: Provide a 10-year adhesive manufacturer's labor and material warranty, countersigned by the Installer, agreeing to remove and replace damaged portions of the roof which resulted solely from failure of adhesion of the roof insulation.
- D. Owner Responsibility: Owner shall notify the primary roofing manufacturer and the Installer of any leaks as they occur during the time period when both manufacturer's and Installer's warranties are in effect.

PART 2 - PRODUCTS

2.1 ROOFING MEMBRANE & FLASHING

- A. Soprema, Inc., Field System 2455 (Elastophene 180 PS set in FMA adhesive & Elastophene Flam FR GR)  
Soprema, Inc. Base Flashing Specification  
2457 (Elastophene 180 PS & Sopralast 50 TV Alu)

2.2 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
  - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Roofing Asphalt: ASTM D312, Type III or IV
- C. Cold Adhesive: FMA Adhesive by Soprema, Inc.
- D. Asphalt Primer: To meet ASTM D41.
- E. Water Cut-Off: Sopracolle or Sopramastic.
- F. Walkpad Membrane: Soprawalk.
- G. Sealant in contact with roof membrane materials: Neoprene as manufactured by Gibson-Gardner.
- H. Cleaning Solution: Non-phosphate cleaning solution.
- I. Fiber Cants: Rigid perlite board of same composition as overlay board, 3-inch vertical (with 3 7/8-inch face) minimum, and as shown on Drawings.
- J. Tapered Edge Strip: Rigid perlite or wood fiber board, sizes as required to provide tapered transition where indicated on Drawings.
- K. Pipe Flashings: 2-piece, 4 lb. de-silvered lead flashing.
- L. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion resistance provisions in FMG 4470, designed for fastening roofing membrane components to associated substrate, tested by manufacturer for required pull-out strength, and acceptable to roof system manufacturer.

## SECTION 07 52 00 MODIFIED BITUMEN MEMBRANE ROOFING

- M. Roofing granules: Ceramic coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, white.
- N. Miscellaneous Accessories: Provide those recommended by the roofing system manufacturer.

### 2.3 TAPERED INSULATION & COVER BOARD

- A. Provide tapered 48 x 48 inches boards to provide slope-to-drain where indicated, fabricated with taper of 1/4 inch per foot in one direction. Use combination of flat and tapered boards at large crickets.
- B. Polyisocyanurate Rigid Board Insulation: 2- layer, rigid boards of minimum 2.0 pounds per cubic foot density closed-cell foam core, permanently bonded to roofing felt or fiberglass-faced sheets. Facing shall be approved by manufacturer of roofing.
  - 1. Johns Manville E'nrg'y 2 Plus, Atlas Acfoam Composite are acceptable products.
  - 2. Insulation units shall be installed in two consecutive and separate layers, with joints of each layer offset from previous layer of insulation.
- C. Cover Board: ASTM C728 perlite board, 3/4-inch thick, seal coated.
- D. Thickness and R-Values:
  - 1. Bottom layer: 2.0 inches, R-15.3 min./max..
  - 2. Top layer: 1.5 inches, R-14.8 min./max.
  - 3. Cover board: 3/4 inches.
- E. Board Size: 48 x 48 inches.
- F. Adhesive: Insta-Stik by Flexible Product Company.
  - 1. Soprema FMA insulation adhesive may be used subject to specified warranty requirement.
- G. Asphalt Adhesive: Asphalt: ASTM D312, Type III or IV

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
  - 2. Verify that cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
  - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
  - 5. Test for moisture by pouring 1 pint (0.5 L) of hot roofing asphalt on deck at start of each day's work and at start of each roof area or plane. Do not proceed with roofing work if test sample foams or can be easily and cleanly stripped after cooling.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Prime surface of concrete deck with asphalt primer at a rate of 3/4 gal./100 sq. ft. and allow primer to dry.

### 3.3 TAPERED INSULATION INSTALLATION



## SECTION 07 52 00 MODIFIED BITUMEN MEMBRANE ROOFING

- A. General: Extend insulation over entire surface to be insulated, as indicated on Drawings, cutting and fitting tightly around obstructions.
  - 1. Form crickets and saddles with tapered insulation as shown and as required for proper drainage of membrane.
  - 2. Stagger joints in both directions between courses with no gaps to form a complete thermal envelope. Limit joints between adjacent units to 1/4 inch maximum.
  - 3. Form drain sumps as shown on the Drawings; cut overlay board to form rectangular sump, and install tapered edge strips at perimeter of sump, stacked to achieve insulation thickness.
- B. Attach bottom layer of rigid board insulation to concrete deck with hot asphalt.
- C. Adhere top layer of rigid board insulation with adhesive in strict accordance with adhesive manufacturer's printed directions.
- D. Fully adhere cover board to underlying insulation. Offset joints of cover board a minimum of 1-foot from the joints of the underlying insulation units. Joints of overlay board shall be butted tight; leave no more than 1/8-inch gap between abutting boards, maximum. Joints exceeding 1/8" shall be filled with insulation.
- E. Insulation cant strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes more than 45 degrees.
- F. Install cricket materials behind curbs exceeding 2-feet in width, and as indicated on drawings, to aid in roof drainage.
- G. Crickets shall be fully adhered to underlying cover board insulation. Joints shall be butted tight; gaps exceeding 1/8-inch shall be filled with insulation.
- H. Cricket materials shall be installed to result in no less than 3/8-inch per foot, finished slope.
- I. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict the flow of water.
- J. Do not install more insulation and cover board than can be covered with roof membrane by the end of day or at onset of inclement weather.
- K. The installation shall cause the insulation boards to rest evenly on the roof deck / substrate so that there are no significant and avoidable air spaces between the boards and the substrate. Each insulation board shall be installed tightly against the adjacent boards in all sides and walked-in-place to assure even and consistent contact with the substrate.

### 3.4 INSTALLATION OF ROOFING

- A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Pay particular attention to seam sealing.
- B. Roofing Plies:
  - 1. All layers of roofing shall be laid free of wrinkles, creases, or fish mouths and shall be laid at right angles to the slope of the deck.
  - 2. Sheets shall be laid directly behind the adhesive applicator. Sufficient pressure shall be exerted during application, using an aluminum rake or broom, to ensure prevention of air pockets.
  - 3. Sheets shall be fully bonded to the prepared substrate and each other and shall have a minimum of 3-inch side and 6-inch end laps.
  - 4. Lap seams of the layers shall not be stacked; stacked laps shall be sufficient cause for rejection of the roof.
  - 4. Install roofing membrane sheets so side and end laps shed water.
  - 5. Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps.
  - 6. Application of roofing shall immediately follow application of insulation and overlay board assembly as a continuous operation.

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7. Adhesive installation shall be, nominally, 24 mils per 1-1/2 gallons per square and 32 mils per 2 gallons per square, and shall be total in coverage leaving no breaks or voids.
8. Apply roofing granules to cover exuded bead at laps while bead is tacky (carry a granule bag during application of top ply sheet).
9. Prime metal flanges with a uniform coating of asphalt primer.
10. Set each ply sheet, in a solid uniform coating of adhesive. Laps shall not buck water and shall be totally sealed.
11. The top ply sheet shall be fully bonded to the base ply sheet surface, and shall have a minimum of 3-inch side and 6-inch end laps.
12. Provide a continuous reinforcing sheet in all waterways.
13. Install valley reinforcing sheets over base ply sheet prior to installation of top ply sheet.
14. Do not install top ply sheet until an inspection of reinforcing sheets has been conducted.
15. Step in all T-joints. T-joints shall be fully sealed and without voids. Other methods to improve T-joint seal include a 45-degree cut and finish asphalt application at joint area.
16. At end of the day's work or when precipitation is imminent, a water cut-off shall be built at all open edges. Cut-offs can be built using adhesive or plastic cement and non-porous roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.

### B. Roof Drain:

1. Roof Drains: Set 30-by-30-inch square metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of 4 inches beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
2. Install stripping according to roofing system manufacturer's written instructions.

### C. Flashing:

1. Bridge junctures of vertical and horizontal surfaces with 45-degree cant strips.
2. Install reinforcing sheets at horizontal to vertical transitions, including curved penetrations and flange type penetrations.
3. Prime the horizontal surface of the top ply sheet at the horizontal to vertical transition with manufacturer approved asphalt primer prior to initiating installation of flashing sheet. Apply the asphalt primer at a rate of 1 gallon per 100 square feet.
4. Install flashing sheets over reinforcing sheets and top ply sheet at horizontal to vertical transitions. Extend a minimum of 8 inches up vertical surfaces, and a minimum of 6 inches onto the primed roof membrane. Extend to top of walls where indicated on drawings.
5. Secure top edge of flashing sheets at vertical surfaces at 8 inches on center using fasteners appropriate to the substrate.
6. Provide corner patches or folded corners at base flashing corners. Blind cut corners are not acceptable. Folded corner tabs shall be cut so that tabs do not exceed 4 inches.
7. Install aluminum foil clad flashing sheets using torch method and pressing in with damp sponge or cloth, as recommended by roof materials manufacturer. Avoid causing delamination of foil surface from underlying membrane. Ensure correct directional orientation of foil clad flashing sheets.

## 3.5 FINISH INSTALLATION

### A. Top Ply Sheet and Flashing Sheet Finish:

1. Apply metallic powder / granules at all laps to cover and protect all exposed asphalt. An aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this Project.

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2. Make necessary preparations, utilize recommended application techniques, apply specified materials (i.e. granules, metallic powder, etc.), and exercise care in ensuring that the finished application is acceptable to Contracting Officer.
- B. Walk Pad Installation:
  1. Install walk pads at roof access locations, roof access ladders, and as otherwise shown on Drawings.
  2. Install walk pads fully adhered to surface of membrane, or as recommended by roof materials manufacturer, leaving minimum 3 inch / maximum 4 inch gap between edges of individual walk pads for proper drainage.

### 3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Test Cuts: Test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
  1. Approximate quantities of components within roofing membrane will be determined according to ASTM D3617.
  2. Test specimens will be examined for interply voids according to ASTM D3617 and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
- C. A roof inspection is required by manufacturer before warranty issue. Revise scope of inspection and source of report to a qualified roofing consultant or an independent testing and inspecting agency if preferred.
- D. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit Report to Contracting Officer.
  1. Notify Owner 48 hours in advance of date and time of inspection.
- E. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional Work with specified requirements.

### 3.7 PROTECTING & CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Contracting Officer.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Remove trash, nails, debris, and equipment from Site and leave Site clean.

### 3.8 COMPLETION

- A. Prior to demobilization from Site, Work shall be reviewed by Contracting Officer and Installer. All defects and non-compliance with Specifications or recommendations of roofing manufacturer shall be itemized in a Punch List. These items must be corrected immediately by Installer to satisfaction of Contracting Officer prior to demobilization.

END OF SECTION



## SECTION 07 53 23 - EPDM MEMBRANE ROOFING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Fully adhered single ply roofing system.
- B. Tapered insulation assembly with substrate board.
- C. Ballast systems.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 03 30 00 - CAST-IN-PLACE CONCRETE: for concrete substrate.
- C. Section 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY: for pressure treated wood blocking.
- D. Section 07 62 00 - SHEET METAL FLASHINGS & TRIM: for Sheet Metal Flashings and Copings.
- E. Section 07 95 15 - SEISMIC JOINT COVERS: for Furnishing of Roof Seismic Joint Covers.

#### 1.3 REFERENCES

- A. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.
  - 2. International Energy Conservation Code (IECC), as amended by State of Washington.
- B. Washington State Administrative Code (WAC):
  - 1. WAC Chapter 51-11, Washington State Energy Code.
- C. FM Global (FM):
  - 1. FM 4470, Approval Standard for Class 1 Roofers.
- D. National (NRCA):
  - 1. ARMA/NRCA Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing.
  - 2. Roofing and Waterproofing Manual.
- E. Roofing Terminology:
  - 1. Refer to ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing Work in this Section.

#### 1.4 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems", before multiplication by a safety factor.
- C. Factored Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems", after multiplication by a safety factor.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
- C. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.
- D. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing

## SECTION 07 53 23 - EPDM MEMBRANE ROOFING

system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1. Fire/Windstorm Classification: Class 1A- 90.

### 1.6 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
  1. Base flashings and membrane terminations.
  2. Insulation and substrate board fastening patterns.
- C. Samples for Verification: For the following products:
  1. 12-by-12-inch square of sheet roofing.
  2. 12-by-12-inch square of substrate board.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  1. Submit evidence of meeting performance requirements.
- F. Qualification Data: For Installer and manufacturer.
- G. Maintenance Data: For roofing system to include in maintenance manuals.
- H. Warranties: Special warranties specified in this Section.
- I. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- B. In continuous business under same name for past 5 years.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- D. Source Limitations: Obtain components for membrane roofing system approved by roofing membrane manufacturer.
- E. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
  1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
  2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
- F. Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to roofing system including, but not limited to, the following:
  1. Meet with Owner; General Contractor, Architect, roofing system manufacturer's representative; and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
  2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

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7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
- G. FM Global Requirements:
  1. Wind Category: Class I-60: Roof systems shall be attached to resist twice the following uplift pressures (safety factor of two):
    - a. 40 pounds per square foot within 10 foot perimeter.
    - b. 25 pounds per square foot for balance of roofs.
  2. Class I assembly, noncombustible.

### 1.8 DELIVERY, STORAGE, & HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
  1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof substrate board from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with substrate board manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

### 1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

### 1.10 WARRANTY

- A. Materials Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials within specified warranty period.
  1. Materials warranty includes roofing membrane, base flashings, roofing accessories, fasteners, substrate board, and other components of membrane roofing system.
  2. Warranty Period: 20 years from date of Substantial Completion.
- B. Installer's Warranty: Submit roofing Installer's warranty, signed by Installer, covering Work of this Section,
  1. Include all components of roofing system including roofing membrane, base flashing, fasteners, substrate board, and other components of roofing system.
  2. Warranty Period: Five (5) years from date of Final Acceptance.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
  2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

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### 2.2 EPDM ROOFING MEMBRANE

- A. Elastic Sheet Membrane: ASTM D 4637, Type I, nonreinforced uniform, flexible sheet made from ethylene propylene diene monomer, and as follows:
  - 1. Manufacturers:
    - a. Firestone Building Products Company.
    - b. Or Approved.
  - 2. Thickness: 90 mils (0.090-inch), nominal.
  - 3. Exposed Face Color: Black.

### 2.3 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Securement Strip: Manufacturer's standard synthetic-rubber polymer primer and 3-inch wide minimum, butyl splice tape with release film, minimum 6-inches wide.
- C. Cover Strip Flashing: Uncured, un-reinforced EPDM laminated to a cured EPDM based adhesive tape, minimum 75-mil- thick, minimum 7-inches wide.
- D. Splice Materials:
  - 1. Splice Tape: Cured EPDM based butyl adhesive tape, 30-mils minimum thickness, as approved by Manufacturer.
  - 2. Splice Primer: Synthetic polymer based, black adhesive, as recommended and approved by Manufacturer.
  - 3. Splice Adhesive: Synthetic polymer based, black adhesive, as recommended and approved by Manufacturer.
- E. EPDM Flashing Sheets:
  - 1. Uncured, un-reinforced EPDM, minimum 60-mil- thick, minimum 6-inches wide.
  - 2. Uncured, un-reinforced EPDM laminated to a cured EPDM based adhesive tape, minimum 75-mil- thick, minimum 7-inches wide.
  - 3. Cured, un-reinforced EPDM laminated to a cured EPDM based adhesive tape, minimum 45-mil- thick, minimum widths as required to perform the work contemplated, as recommended by the manufacturer.
  - 4. Cured, reinforced EPDM, minimum 45-mil- thick, reinforced with a fully encapsulated woven polyester scrim, minimum widths as required to perform the work contemplated, as recommended by the manufacturer.
- F. Tapered Edge Strips: High density wood fiber board capable of accepting fully adhered membrane as accepted by the manufacturer; 6-inch wide, 4-foot long, tapering from 0-inch to 1-inch in thickness.
- G. Membrane Seam Sealant: Black light aliphatic solvent-based sealant as manufactured and / or recommended by roofing materials manufacturer.
- H. Splice Wash: Solvent based effacing solution, manufactured for the purpose of cleaning EPDM membrane surfaces prior to performing seaming activities, as manufactured and / or recommended by roofing materials manufacturer.
- I. Bonding Adhesive: Manufacturer's low VOC bonding adhesive. A high strength, yellow colored, synthetic rubber contact adhesive manufactured for the purpose of bonding EPDM membrane to substrates including, masonry, concrete, wood, and metal surfaces, while achieving FMG wind uplift requirements, as manufactured and / or recommended by roofing materials manufacturer.
- J. Flashing Adhesive: Manufacturers standard synthetic polymer splice adhesive to be used for membrane flashings or where membrane interfaces with membrane or membrane flashing sheet.
- K. Lap Sealant: Manufacturer's standard single-component sealant, color to match roofing membrane.
- L. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- M. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1-inch by 1/8-inch thick; with anchors.



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- N. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
- O. Miscellaneous Accessories: Provide pourable sealers, preformed cones, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

### 2.4 SUBSTRATE BOARD

- A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 5/8-inch thick.
  - 1. Product: Subject to compliance with requirements, provide "Dens-Deck" manufactured by Georgia-Pacific Corporation.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening substrate panel and insulation units to roof deck.

### 2.5 TAPERED INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
  - 1. Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.
  - 2. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

### 2.6 BALLAST SYSTEM

- A. Rock Ballast: ASTM D 1863: opaque, washed, smooth aggregate: 3/4" - 1 1/2", water-worn gravel.
- B. Precast Concrete Pavers: Heavyweight, hydraulically pressed, concrete units, square edged, manufactured for use as roof deck pavers; minimum compressive strength 7000 psi, with no individual unit less than 6,500 psi, ASTM C 140; absorption not greater than 6 percent, ASTM C 140; no breakage and maximum 1 percent mass loss when tested for freeze-thaw resistance, ASTM C 67; and as follows:
  - 1. Size: 24" x 24" x 2" thick.
  - 2. Manufacture pavers to dimensional tolerances of plus or minus 1/16-inch in length, height, and thickness.
  - 3. Colors and Textures: As selected by Owner and Architect from manufacturer's standard selection of material colors.
  - 4. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Wausau Tile, Inc.; Terra-Paving Div. – Terra Pavers-H; Type 1 Exposed Stone Aggregated.
    - b. Or Approved.
- C. Filter Fabric: Woven geotextile fabric, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation less than 50 percent; complying with the following properties determined according to AASHTO M 288:
  - 1. Survivability: Class 2.
  - 2. Apparent Opening Size: No. 30 sieve, maximum.
  - 3. Permittivity: 0.50 per second, minimum.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and set and braced.

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2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of substrate board.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and from spilling or migrating onto surfaces of other construction.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- D. Prepare all surfaces and details in accordance with roofing materials Manufacturer's printed installation instructions and these Contract Documents.

### 3.3 TAPERED INSULATION INSTALLATION

- A. Comply with roofing manufacturer's written instructions for installing roof insulation.
- B. Mechanically fasten 4-inch nominal- width wood nailer strips of same thickness as insulation perpendicular to sloped roof deck if required by manufacturer.
- C. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
  1. Fasten insulation according to requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.
  2. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- D. Install tapered insulation under area of roofing to conform to slopes indicated.
- E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
  1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations, or as required by the manufacturer.
- F. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.4 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
- B. Install substrate with mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation over tapered insulation assembly.
  1. Fasten substrate board according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
  2. Fasten substrate board to resist uplift pressure at corners, perimeter, and field of roof.
- C. Minimum fastener pattern shall be 1 fastener per 2 square feet of board with fasteners increased by 50% at first four (4) feet of all perimeters and first eight (8) feet of all corners

### 3.5 ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

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- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Accurately align roofing membranes, without stretching, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.
- E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeters.
- F. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- G. Adhesive Seam Installation: Clean and prime both faces of splice areas, apply splicing cement, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.
  - 1. Apply a continuous bead of in-seam sealant before closing splice if required by membrane roofing system manufacturer.
  - 2. Adhere continuous cover tape centered over all field seams.
- H. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.
- I. Repair tears, voids, and lapped seams in roofing that does not meet requirements.
- J. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.
- K. Paver and Aggregate Ballast: Install heavyweight roof pavers according to manufacturer's written instructions on roof corners and perimeter.
  - 1. Install Size 4 aggregate ballast elsewhere on roofing at a minimum rate of 10 lb/sq. ft.

### 3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with preformed cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of flashing sheet and mechanically anchor to substrate through termination if membrane does not extend over top of wall.

### 3.7 BALLAST SYSTEM INSTALLATION

- A. Precast Concrete Pavers:
  - 1. Install concrete pavers at locations indicated on the Drawings and according to manufacturer's written instructions.
  - 2. Loosely lay pavers over filter fabric and insulation with joints tight. Align joint patterns parallel in each direction.
    - a. Lay out pavers to avoid less-than-half-width pavers at perimeter or other terminations.
    - b. Install pavers to not vary more than 1/16-inch in elevation between adjacent pavers or more than 1/16-inch from surface plane elevation of individual paver.
    - c. Maintain tolerances of paving installation within ¼-inch in 10-feet of surface plane in any direction.
- B. Rock Ballast:

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1. Apply rock ballast uniformly over filter fabric over roofing membrane at the rate of 10 – 15 pounds per square foot; distribute with care to minimize possibility of damage to membrane roofing system.
2. Apply rock ballast to cover and protect all exposed filter fabric. An aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this Project.
3. Make necessary preparations, utilize recommended application techniques, apply specified materials, and exercise care in ensuring that the finished application is acceptable to the Owner.

### 3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspection and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Consultant.
  1. Notify Consultant or Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.9 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Consultant and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

## SECTION 07 60 00 SILICONE SHEET FLASHING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide silicone sheet flashing at building exterior envelope in accordance with Contract Documents.
- B.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 33 12 – COORDINATED SUBMITTAL REQUIREMENTS: Submittals of this Section are affected by coordinated simultaneous submittal requirements.
- D. Section 01 45 21 TESTING LABORATORY SERVICES: Testing.
- E. Section 03 30 00 CAST-IN-PLACE CONCRETE: Concrete fill.
- F. Section 05 12 00 STRUCTURAL STEEL: Hoisting of Metal Decking.
- G. Section 09 22 16 NON-STRUCTURAL METAL FRAMING: Ceiling Hangers.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1.

#### 1.4 QUALITY ASSURANCE

- A. Adhesion Testing: Perform mock-up test on all adjoining substrates and components to ensure proper adhesion.

#### 1.5 SUBMITTALS

- A. Submittal Procedure: See Section 01 33 00.
- B. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these Specifications.
- C. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details and conditions requiring closure panels, supplementary framing, cut openings, special jointing and accessories.

#### 1.6 PRODUCT HANDLING

- A.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Silicone Sheet Flashing:
  - 1. Silicone Rubber Extrusions (SRE): Extruded, 40 durometer, silicone, 6-inch width x 50 feet rolls.
  - 2. Silicone Rubber Corners (SRC): Pre-molded corners of same material as SRE.
- B. Acceptable Manufacturer: Proglaze ETA by Tremco.

#### 2.2 ACCESSORIES

- A. Sealant: Spectrum 1 Silicone Sealant by Tremco.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

#### 3.2 INSTALLATION, GENERAL

- A.

## SECTION 07 60 00 SILICONE SHEET FLASHING

### 3.5 FIELD QUALITY CONTROL A.

### 3.6 REPAIRS & PROTECTION

- A. Galvanized Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds and abraded areas on surfaces of prime-painted deck immediately after installation, and apply repair paint.

END OF SECTION

## PART 1 - GENERAL

## 1.1 SECTION INCLUDES:

- A. Provide sheet metal flashings and trim in accordance with the Contract Documents:
  - 1. Roof copings
  - 2. Counter flashings
  - 3. Roof edge flashings (gravel stop)
  - 4. Wall cladding
  - 5. Internal gutter
  - 6. Exterior Expansion joint cover
- B. Where not otherwise indicated, provide and install sheet metal flashings and trim in accordance with generally accepted industry standard details as indicated in SMACNA Architectural Sheet Metal Manual, NRCA Membrane Roof Systems, and primary roofing manufacturer's published details at all exterior openings, penetrations through exterior walls and roofing, exterior joints, copings, caps of parapets and other systems.

## 1.2 RELATED SECTIONS:

- A. Drawings, General Conditions and Division 1 apply to Work in this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: Product data.
- C. Section 01 33 12 – COORDINATED SUBMITTAL REQUIREMENTS: Submittals of this Section are affected by coordinated simultaneous submittal requirements.
- D. Retain Sections in subparagraphs below that contain requirements Contractor might expect to find in this Section but are specified in other Sections.
- E. Section 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY for pressure treated wood blocking.
- F. Section 07 41 13 - METAL ROOFING: Ridge flashing and gutters.
- G. Section 07 52 00 – SBS MODIFIED BITUMEN MEMBRANE ROOFING: installation of sheet metal flashing and trim integral with membrane roofing.
- H. Section 07 53 23 - EPDM MEMBRANE ROOFING: installation of sheet metal flashing and trim integral with membrane roofing.
- I. Section 09 06 09 - EXTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.

## 1.3 REFERENCES

- A. ASTM International (ASTM)
  - 1. ASTM A167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
  - 2. ASTM A 653 / A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 3. ASTM A 755 / A 755M, Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  - 4. ASTM B32, Standard Specification for Solder Metal.
- B. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA):
  - 1. Architectural Sheet Metal Manual.

## 1.4 QUALITY ASSURANCE

- A. Standards: Comply with the Standards listed under Article 1.4 of this Section as applicable, unless otherwise shown or specified.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

## 1.5 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

## 1.6 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
  - 1. Identification of material, thickness, weight, and finish for each item and location in Project.
  - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
  - 3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  - 4. Details of termination points and assemblies, including fixed points.
  - 5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
  - 6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings as applicable.
  - 7. Details of special conditions.
  - 8. Details of connections to adjoining work.
- C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.
- D. Qualification Data: For qualified fabricator.
- E. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.
- F. Warranty: Sample of special warranty.

## 1.7 DELIVERY, STORAGE, &amp; HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

## 1.8 WARRANTY

- A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

## 2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Zinc coated (galvanized) steel sheet (for concealed cleats): 22 gauge; ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.



## SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

- C. Pre-painted, metallic coated steel sheet (for Type A Copings and counter flashings): steel sheet metallic coated by the hot dip process and pre-painted by the coil-coating process to comply with ASTM A755/A755M.
  - 1. High-Performance Organic Finish: Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - a. Fluoropolymer 2-Coat System: Manufacturer's standard, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a minimum total dry film thickness of 1.5 mil; complying with physical properties and coating performance requirements of AAMA 2605, except as modified below.
      - 1) Humidity Resistance: 1000 hours.
      - 2) Salt-Spray Resistance: 1000 hours.
  - 2. Colors: Selected from manufacturers full range of standard colors, unless otherwise indicated in below sections, and as approved by Owner.
- D. Smooth 5005-H34 ASTM B 209 alloy aluminum (for Type B Copings): 0.060 inch thick, with fluoropolymer finish.
- E. Stainless-Steel Sheet: Type 304 complying with ASTM A167.
  - 1. Two-Piece Counter Flashings: 0.021-inch thick. Soldered joints complying with ASTM B32.
  - 2. Saw-Cut or Precast Reglet (at concrete): Min. 0.025-inch thick soft temper, standard uncoated finish, Grade 2D.
  - 3. Internal Gutter: Min. 0.025-inch thick, mill finish.
- F. "CO" Concrete Reglet by Fry Reglet.
- G. Splice Plates: Same metal as coping, for Type A and Type B, respectively.

### 2.2 UNDERLAYMENT MATERIALS

- A. Felts (to separate dissimilar metals): ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- B. Self-Adhering Underlayment (for vertical planes and transitions and parapet walls): High-temperature sheet, minimum 40 mil (1.0-mm-) thick, polyethylene film laminated to layer of rubberized asphalt adhesive; maximum permeance rating of 0.1 perm (6 ng/Pa x s x sq. m); cold-applied with slip-resisting surface and release-paper backing.
  - 1. Provide primer when recommended by vapor-retarder manufacturer; 36-inch wide rolls.
  - 2. Provide material that can withstand high in-service temperatures for extended periods of time.
  - 3. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
  - 4. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
  - 5. Products: Subject to compliance with requirements:
    - a. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
    - b. Or Approved.
- C. EPDM Sheet: ASTM D 4637, Type II, scrim or fabric internally reinforced, uniform, flexible, 45 mil. thick, black (for installation at the internal gutter).
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Carlisle Syntec, Inc.
    - b. Firestone Building Products
    - c. Johns Manville
    - d. Or Approved.
- D. Heat Protection Sheet: Asbestos or other heat protection sheet, which can provide sufficient protection to guard against heat damage during in place welding.

## 2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
  - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
  - 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
  - 4. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.
- C. Solder:
  - 1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
  - 2. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

## 2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
  - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  - 2. Obtain field measurements for accurate fit before shop fabrication.
  - 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
  - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate concealed cleats from Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality; 22 gauge.
- G. Seams for Stainless Steel and Lead: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

## SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

- H. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- I. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

### 2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Internal Gutters: Fabricate in continuous sections, prepped and formed to accept welded seams at all connections and penetrations complete with end pieces, outlet tubes, and other special accessories as required. Fabricate expansion joints and accessories from same metal as gutters unless otherwise indicated.
  - 1. Fabricate gutters with built-in expansion joints.
  - 2. Sheet Metal: Stainless Steel: 0.025 inch thick.
  - 3. Color: Selected from manufacturers full range of standard colors and as approved by Owner.
- B. Downspouts: Fabricate downspouts in profiles as indicated on the Drawings complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
  - 1. Sheet Metal: Stainless Steel: 0.025 inch thick.
  - 2. Color: Selected from manufacturers full range of standard colors and as approved by Owner.

### 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (gravel stops): Fabricate with profiles as shown on the Drawings and of Type A coping metal with front cleats as used for copings.
  - 1. Joint Style: Lapped 4 inches wide and sealed.
  - 2. Sheet Metal: Pre-painted, metallic-coated sheet, 24 gauge.
  - 3. Color: Selected from manufacturers full range of standard colors and as approved by Owner.
- B. Copings: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.
  - 1. Fabricate thick wall copings for flat lock seams.
  - 2. Where copings butt against higher walls, fabricate closed-end splices (saddles) for attachment to the higher wall.
  - 3. Where walls terminate, provide finish ends with level tops and bottoms to match front of coping.
  - 4. Type A Copings:
    - a. Joint Style: Standing seam - minimum 1-inch high with folded and sealed seams.
    - b. Sheet Metal: Pre-painted, metallic-coated sheet, 24 gauge.
    - c. Color: Color as scheduled in section 09 06 10.
  - 5. Type B Copings:
    - a. Joint Style: Joint Style: Butt with 12-inch wide concealed backup plate – centered over butt joint.
    - b. Sheet Metal: Alloy aluminum, 0.060 inch thick
    - c. Color: Match color of metal panels.
- C. Wall Panels: Fabricate with profiles as shown on the Drawings.
  - 1. Joint Style: S-locks at 48-inches on center - minimum 1-inch wide and fully sealed.
  - 2. Sheet Metal: Pre-painted, metallic-coated sheet, 24 gauge.
  - 3. Provide vertically oriented breaks in sheet metal panels to control oil-canning; breaks to occur at 24-inches on center.
  - 4. Color: Selected from manufacturers full range of standard colors and as approved by Owner.

## SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

- D. Two Piece Counter flashing: Fabricate with profiles as shown on the Drawings and per SMACNA or use manufactured flashing, consisting of a receiver and a removable counter flashing.
  - 1. Joint Style: Lapped and sealed.
  - 2. Sheet Metal: Pre-painted, metallic-coated sheet, 24 gauge.
- E. Reglet Counter Flashing: Fabricate with profiles as shown on the Drawings.
  - 1. Joint Style: Lapped and sealed.
  - 2. Sheet Metal: Cast-in Reglet Style and Manufacturer:
    - a. "CO" Concrete Reglet by Fry Reglet.
- F. Vent Pipes and Electrical Conduits: Performed lead type pipe flashings pre-manufactured w/ two-piece design; fabricated to conform to slope requirements.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
  - 1. Verify compliance with requirements for installation tolerances of substrates.
  - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  - 3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
  - 4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
  - 5. Install sealant tape where indicated.
  - 6. Torch cutting of sheet metal flashing and trim is not permitted.
  - 7. Do not use graphite pencils to mark metal surfaces.
  - 8. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
  - 1. Coat back side of stainless-steel, uncoated aluminum, and lead sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
  - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Self-adhering underlayment: Install over all substrate where changes in plane occur, such as parapet wall transitions, wall penetrations, etc.
- D. EPDM Sheet: Install inside internal gutter where indicated on the Drawings. Utilize heat protection sheet to protect underside of EPDM sheet from weld damage.

## SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

- E. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- F. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- G. Seal joints as shown and as required for watertight construction.
  - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
  - 2. Prepare joints and apply sealants to comply with project requirements.
- H. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.
  - 1. Do not solder metallic-coated steel and aluminum sheet.
  - 2. Pre-tinning is not required for lead.
  - 3. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
  - 4. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
- I. Rivets: Rivet joints in where indicated and/or where necessary for strength.

### 3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Internal Gutters: Join sections with welded seams. Provide for thermal expansion. Slope to downspouts. Provide end closures and seal watertight with sealant.
  - 1. Install heat protection sheet under all weld locations during in place welding.
  - 2. Install EPDM sheet layer in internal gutter trough and extend to drip edge at eaves. Lap ends a minimum of 4 inches. Fasten with roofing nails.
  - 3. Anchor gutter system as indicated on the Drawings.
  - 4. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart.
  - 5. Install expansion-joint caps.
- C. Downspouts: Join sections with 1-1/2-inch telescoping joints.
  - 1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.
  - 2. Provide elbows at base of downspout to direct water away from building.
  - 3. Connect downspouts to underground drainage system indicated.
- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches in direction of water flow.

### 3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

## SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

- B. Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 16-inch centers.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.
  - 1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
  - 2. Anchor interior leg of coping with screw fasteners and washers at 24-inch centers.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- E. Counter flashing: Coordinate installation of counter flashing with installation of base flashing. Insert counter flashing in reglets or receivers and fit tightly to base flashing.
- F. Gravel Stops:
  - 1. Interlock exterior bottom edge of gravel stops with continuous cleats anchored to substrate at 24 inches on center.
  - 2. Embed roof edge into mastic provided under Division 7 roofing Section, and nail into wood blocking at 4 inches on center.
- G. Cast-in Reglet: Cover with foam backer rod during concrete pour to prevent grout and concrete from settling in reglet opening.
- H. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with butyl sealant and clamp flashing to pipes that penetrate roof.

### 3.5 CLEANING & PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

## SECTION 07 72 00 ROOF ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Roof expansion joint covers.
- B. Roof curbs and supports.
- C. Pipe portals.
- D. Roof anchors.
- E. Davits.

#### 1.2 RELATED SECTIONS

- A. Section 01 33 00 – SUBMITTAL PROCEDURES: for submittal procedures.
- B. Section - METAL FINISHES.

#### 1.3 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
  - 1. Indicate profiles, anchorages, jointing details, flashings and accessories.
  - 2. Include color charts for finish indicating manufacturer's standard colors available for selection.
  - 3. Include sample of warranty customized for this project.
- B. Shop Drawings: Indicate typical layout including dimensions, configuration, locations, interface with adjacent systems, clearances, tolerances, frequency of attachment, and fabrication details.
  - 1. Submit detail drawings of transitions, intersections and connections.
  - 2. Submit detail drawings of accessory components not included in manufacturer's product data.
- C. Informational Submittals: Submit following packaged separately from other submittals:
  - 1. Manufacturer's instructions.
- D. Closeout Submittals: Submit specified warranty in accordance with Section 01 77 00.

#### 1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Furnish each product from one manufacturer, unless otherwise acceptable to Architect.
- B. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section.
- C. Roof Curb Installer Qualifications: Acceptable to manufacturer with experience on at least five projects of similar nature.

#### 1.5 DELIVERY, STORAGE & HANDLING

- A. Comply with Section 01 60 00.
  - 1. Stack materials to prevent twisting, bending and abrasions, and to provide ventilation.

#### 1.6 WARRANTY

- A. Special Warranty: Prepare and submit in accordance with Section 01 77 00.
  - 1. Warrant installed roof expansion joint, covers, fascias and coping to be free from defects in material and workmanship for time period to match roof system specified in Section [insert].

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Structural Quality Galvanized Steel: ASTM A653 Quality SS, minimum Grade 33, galvanized with G90 coating.
- B. Aluminum Extrusions: ASTM B221, alloy and tempered as required by manufacturer for intended use but not less than strength and durability qualities of alloy 5005-H15.
- C. Aluminum Sheet: ASTM B209, alloy and tempered as required by manufacturer for intended use but not less than strength and durability qualities of alloy 6063-T5.

## SECTION 07 72 00 ROOF ACCESSORIES

- D. Preservative Pressure Treated Wood: Softwood lumber treated in accordance with AWPAC2 for above grade use.
- E. Bituminous Paint: SSPC Paint 12
- F. Roofing Cement: ASTM D4586, Type I.
- G. Davits: **[insert]**
- H. Roof Anchors: **[insert]**

### 2.2 ROOF EXPANSION JOINT COVERS

- A. Acceptable Products and Manufacturers:
  - 1. Pro-Bel [www.pro-bel.com](http://www.pro-bel.com)
  - 2.
- B. Description: Flexible bellows mechanically fastened to metal nailing flanges.
  - 1. Style: L-Shaped curb flanges.
  - 2. Flange Metal: 26 gage commercial quality galvanized steel.
  - 3. Bellows: Manufacturer's standard EPDM or chlorosulfonated polyethylene (CPE) laminated with closed cell foam.
  - 4. Size to accommodate nominal joint width of 1 [2] inches.
  - 5. Accommodate movement in three dimensions plus torsion.
  - 6. Provide factory-formed configurations, corners, intersections, and transitions.
- C. Accessories:
  - 1. Primer, Adhesives, Joint/Lap Cement, Splice Strips and Bituminous Coatings: Types and composition recommended by manufacturer of expansion joint assemblies.
  - 2. Fasteners: Large headed nails of type and size recommended by manufacturer of expansion joint assemblies, compatible with metal flanges.

### 2.3 ROOF CURBS & SUPPORTS

- A. Acceptable Roof Curb Products and Manufacturers:
  - 1. Pro-Bel [www.pro-bel.com](http://www.pro-bel.com)
  - 2.
- B. Acceptable Equipment Support Rail Products and Manufacturers:
  - 1. Pro-Bel [www.pro-bel.com](http://www.pro-bel.com)
  - 2.
- C. Acceptable Pipe Roller Support Products and Manufacturers:
  - 1. Pro-Bel [www.pro-bel.com](http://www.pro-bel.com)
  - 2.
- D. General:
  - 1. Sheet Metal: Structural quality galvanized steel, thickness to suit spans and imposed loads with corner seams mitered and welded.
  - 2. Insulation: 3 PCF density, rigid glass fiber board, minimum 1-1/2 inches thick.
  - 3. Wood Nailers and Grounds: Preservative pressure treated wood, minimum 2 inch cross sectional dimensions.
  - 4. Height: 8 inches minimum above elevation of finished roofing, except where indicated otherwise.
  - 5. Built-in Cant: 3 inch wide; 45 angle.
  - 6. Fabricate with bottom edge of built-in cant raised above roof deck surface to accommodate roof deck insulation.
  - 7. Roof Curbs: Accommodate curb-mounted equipment and pipe portals; coordinate requirements prior to fabrication.
  - 8. Pipe Rollers Supports: Provide with single channel atop curb to support threaded rods holding pipe rollers.
    - a. Size pipe rollers to accommodate pipe sizes.

### 2.4 PIPE PORTALS

- A. Acceptable Products and Manufacturers:
  - 1. Pro-Bel [www.pro-bel.com](http://www.pro-bel.com)
  - 2.



## SECTION 07 72 00 ROOF ACCESSORIES

- B. Description: Manufacturer's standard ABS and EPDM rubber boots to accommodate 3/8 through 6 inch diameter pipe.
  - 1. Furnish complete with stainless steel hose clamps.
  - 2. Accommodate quantity and size of piping to pass through portal caps.
  - 3. Fabricate for mounting atop manufacturer's curb.

### 2.6 ROOF HATCHES

- A. Acceptable Roof Hatch Manufacturers:
  - 1. Pro-Bel [www.pro-bel.com](http://www.pro-bel.com)
  - 2.
- B. Description:
  - 1. Access Roof Hatch for Vertical Ladder: Single Leaf, Nominal Size (30 inches by 36 inches) unless otherwise indicated on Drawings.
  - 2. Structural quality galvanized steel or aluminum construction acceptable.
    - a. Aluminum Finish: Manufacturer's standard acrylic lacquered protective coating over mill finish.
    - b. Steel Finish: Manufacturer's standard shop applied prime coat.
  - 3. Cover: Fabricate with (3 inch) beaded flange, welded.
  - 4. Curb: (12 inch) high minimum with (3-1/2 inch) flange equipped with clearances holes for securing to deck.
    - a. Equip with integral metal cap flashing, same gage as curb.
    - b. Fully cover and protect cover insulation with metal liner.
    - c. Fabricate with top of curb level and bottom to accommodate roof slope.
  - 5. Curb Insulation: (1 inch) fiber board.
  - 6. Cover Insulation: (1 inch) thick glass fiber, expanded polystyrene, or expanded polyurethane.
  - 7. Access Hatch Hardware: Manufacturer's standard hinges, compression spring operators, positive snap latch with turn handles inside and out, padlock hasp inside, automatic hold-open device with vinyl covered grip handle, and neoprene draft seal.
    - a. Hardware Finish: Cadmium or zinc plated steel Stainless steel.
    - b. Finish: Cadmium or zinc plated steel Stainless steel.
  - 8. Fabrication: Fabricate free of visual distortions and defects.
    - a. Weld corners and joints.
    - b. Provide for removal of condensation occurring within components or assembly.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions and proceed with Work in accordance with Section **[insert]**.
  - 1. Verify that deck, curbs, blocking, cants, roof membrane, and base flashing are in place and positioned correctly.
- B. Preformed Fascia, Gravel Guard, and Coping: Verify that coverage onto vertical finish materials is sufficient to result to watertight installation.
  - 1. Verify membrane terminations and base flashings are in place, sealed, and secure.

### 3.2 INSTALLATION

- A. Roof Specialties and Accessories: Install units plumb, level, square, and free from warp or twist while maintaining dimensional tolerances and alignment with surrounding construction.
  - 1. Apply bituminous paint on metal surfaces of units in contact with cementitious materials and dissimilar metals.
  - 2. Securely anchor roof accessories to supporting substrates with appropriate type fasteners.
  - 3. Coordinate with installation of roofing system, tapered insulation, roof slope, and related flashings.

## SECTION 07 72 00 ROOF ACCESSORIES

- B. Expansion Joint Covers: Install as indicated and in accordance with NRCA TS-P-15
  - 1. Where installed over asphaltic roof membrane and base flashings set metal flanges in full bed of roofing cement.
  - 2. Provide in continuous pieces without splices where ever possible.
    - a. Where required, splice sections in accordance with manufacturer's instructions producing watertight installation.
  - 3. Utilize factory fabricated intersections and transitions wherever possible. Field fabricate where pre-manufactured sections are not available.
  - 4. Maintain uniform profile; do not stretch or compress bellows.
- C. Preformed Fascia and Coving: Secure in place with concealed fasteners using methods as recommended by manufacturer to comply with FM rating.
  - 1. Seal joints watertight.
- D. Roof Curbs: Integrate curbs with adjacent roofing systems, base flashings, and counter flashings to create watertight conditions.
- E. Roof Hatches : Secure flanges to deck by bolting or welding.
  - 1. Access Roof Hatch for Ladders : Orient hatch with opening side and operating hardware location close to top of ladder.
  - 2. Signage: Provide permanent signage with minimum (1 inch) high letters at top surface and underside surface of hatch cover to read: **KEEP HATCH CLOSED WHEN NOT IN USE**. Comply with CABO/ANSI A117.1 requirements.

### 3.3 ADJUSTING AND CLEANING

- A. Adjusting: Adjust roof hatch covers and hardware for smooth, uniform operation.
- B. Cleaning: Comply with Section 01 74 00. Clean as recommended by manufacturer. Do not use materials or methods which may damage finish or surrounding construction. Clean primer, adhesive, flashing cements, and other products from surfaces, exposed sheet metal and bellows.

END OF SECTION

## SECTION 07 81 00 SPRAYED-ON FIREPROOFING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Work of this Section is Delegated Design. See requirements of Section 01 36 00.
- B. Provide cementitious sprayed-on fireproofing in accordance with Contract Documents.
  - 1. Thickness of fireproofing shall be bidder determined and submitted with UL or approval of agency documentation.
- C. Scope of Fireproofing on Structural Steel:
  - 1. Columns, girders and beams on all floors and roof framing.
- D. This specification is based on low density material and applies to Type 1A construction. High density material should be designed where subject to human impact.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 36 00 - DELEGATED DESIGN REQUIREMENTS: for bidder-design requirements.
- D. Section 05 12 00 - STRUCTURAL STEEL: for substrate to receive sprayed-on fireproofing.

#### 1.3 DEFINITIONS: The following definitions apply to Work of this Section and are based on Table 601 of International Building Code (IBC):

- A. Structural frame: The structural frame shall be considered to be the columns, girders, beams and spandrels having direct connections to the columns and bracing members designed to carry gravity loads.
- B. Secondary members: Secondary members shall be beams of floor and roof systems which have no connection to the columns and are not a part of the structural frame. Ledge angles supporting floors or roof, bracing members that provide lateral stability to roof or floor beams, including connections shall be considered secondary members.

#### 1.4 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 3. ASTM E605, Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members.
  - 4. ASTM E736, Standard Test Method for Cohesion / Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - 5. ASTM E759, Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.
  - 6. ASTM E760, Standard Test Method for Effect of Impact Bonding of Sprayed Fire-Resistive Material Applied to Structural Members.
  - 7. ASTM E761, Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.
  - 8. ASTM E859, Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members.
  - 9. ASTM E937, Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members.
- B. International Code Council (ICC):
  - A. International Building Code (IBC), as amended by State of Washington.

#### 1.5 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Comply with UL test requirements and ICC-ES approval requirements.
- B. Submit all necessary materials and test data as may be required by governing authority, to obtain approval to apply sprayed-on fireproofing.

## SECTION 07 81 00 SPRAYED-ON FIREPROOFING

- C. Provide coverage and thickness as required by governing authority to obtain fire ratings specified herein.
  - 1. Fireproofing thickness may be calculated per weight-to-heated perimeter ratios per IBC Section 721.5.1.3.
- D. Special Inspection: The Owner will engage an independent testing and inspection agency to inspect and test completed installation to determine density and thickness of sprayed-on fireproofing.
  - 1. Cooperate with the testing laboratory. Thickness of application will be checked in accordance with ASTM E605.
  - 2. Recoat areas where thickness is less than minimum on approved Submittal.
- E. Requirements of Fireproofing Applicator: Fireproofing Work shall be performed by a firm acceptable to sprayed-on fireproofing material manufacturer.
- F. Standards: Comply with provisions of ASTM Standards listed under Paragraph 1.4A of this Section, except as otherwise indicated.

### 1.6 PERFORMANCE REQUIREMENTS

- A. Provide fireproofing material of thickness and density required for the following fire resistance ratings:
  - 1. Structural frame supporting floors (columns, beams and girders): 3 hours.
  - 2. Structural frame supporting roof only: 2 hours.
  - 3. Secondary members supporting floors (beams and braces): 2 hours.
  - 4. Secondary members supporting roof only: 1-1/2 hours.
  - 5. Metal deck supporting concrete floors: 2 hours.
  - 6. Metal deck supporting roofs: 1-1/2 hours.
- B. For this Project all members shall be considered "restrained" per ASTM E119.

### 1.7 DEFERRED SUBMITTAL (see definition under Section 01 42 00)

- A. Submit under the provision of Section 01 33 00.
- B. Deferred Submittal Documents: Prepare and submit manufacturer's product data, drawings showing required thickness of fireproofing, and include documentation from ICC-ES or other approved agency substantiating the sizing of fireproofing.
  - 1. Framing plans: Obtain and pay for reproducible plans of structural framing plans and indicate thickness of fireproofing on beams and columns.
  - 2. Building official approval: Provided Submittal is satisfactory and complete, Architect or Structural Engineer will stamp Submittal with their respective review stamp for submittal to Building Official for approval.
  - 3. Distribution: Upon approval by Building Official, distribute copies of approved Submittal to all concerned trades, including one set to Special Inspector.
- C. Test Data: Submit, upon request by the Architect, certified copies of laboratory tests of sprayed-on fireproofing as specified herein for the following:
  - 1. Corrosion resistance.
  - 2. Deflection.
  - 3. Bond impact.
  - 4. Bond strength.
  - 5. Air erosion.
  - 6. Compressive strength.
  - 7. Surface burning characteristics.

### 1.8 PRODUCT HANDLING

- A. Deliver materials to project site in manufacturer's unopened containers, fully identified with trade name, type, grade and other classifying data, and bearing the UL label if required.
- B. Store above grade, in a dry location and protected from the weather.
- C. Discard materials which have been exposed to dampness before use.

### 1.9 JOB CONDITIONS

- A. Do not apply sprayed-on materials to substrates which are below temperatures of 40 deg F.

## SECTION 07 81 00 SPRAYED-ON FIREPROOFING

- B. Maintain minimum temperature of 40 deg F for a period of 24 hours prior to, during and 24 hours after application of fireproofing material.
- C. Provide ventilation to allow for proper drying of the fireproofing during and subsequent to its application.
- D. In poorly ventilated areas lacking natural ventilation, forced air circulation shall be required to achieve a total air exchange rate of four per hour until the material is substantially dry.

### 1.10 PROTECTION

- A. Conduct spraying operations in a manner which protects persons and other work in the vicinity against exposure to spray-on materials by complying with the latest rules and regulations of governing local, state and federal agencies.
- B. Protect sprayed-on insulation during the construction period.
- C. Fireproofing damaged or removed shall be repaired or replaced to comply with this Specification prior to concealment and prior to date of Final Acceptance.
- D. Where adjacent surfaces subject to overspray are to remain permanently exposed, protect these specific surfaces with masks, drop cloths or other satisfactory coverings.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Fireproofing Materials: Provide materials which have been tested and approved by UL and are listed under their Label Service, and in addition are approved by the local building department having jurisdiction.
- B. The material shall be cementitious sprayed fire-resistive material consisting of factory-mixed, dry formulation of Portland cement binders and lightweight mineral or synthetic aggregates mixed with water at Project Site to form a slurry or mortar for conveyance and application and complying with the following minimum requirements.
  - 1. Sprayed-on fireproofing: Provide self-adhesive non-flaking, non-dusting type, without the use of organic adhesive on substrate.
  - 2. Provide thickness and density required to provide specified fire rating.
  - 3. Corrosion resistance: When tested in accordance with ASTM E937, material shall demonstrate that it inhibits corrosion of steel when applied to unpainted steel.
  - 4. Deflection: Material shall not crack or delaminate when tested in accordance with ASTM E759.
  - 5. Bond impact: Material shall not crack or delaminate from the surface to which it is applied when tested in accordance with ASTM E760.
  - 6. Bond strength per ASTM E736: 200 pounds per square foot minimum.
  - 7. Air erosion: Maximum weight loss of 0.005 grams per square foot per ASTM E859.
  - 8. Density, minimum average dry density per ASTM E605: As listed in UL Fire Resistance Directory for each rating required.
  - 9. Compressive strength, tested in accordance with ASTM E761: Shall not deform more than 10 percent.
  - 10. Surface burning characteristics: when tested in accordance with ASTM E84:
    - a. Flame spread: 0.
    - b. Smoke development: 0.
- C. Water: drinkable, free from rich amounts of mineral or organic substances as would affect the set of the fireproofing material.

## PART 3 - EXECUTION

### 3.1 CONDITION OF SURFACES

- A. Examination and Acceptance: Examine substrates and adjoining construction, and conditions under which Work is to be installed.
- B. Do not proceed with Work until unsatisfactory conditions have been corrected.
- C. All surfaces to receive spray-applied fireproofing shall be free of oil, grease, paints / primers, loose mill scale, dirt or other foreign substances which may impair proper adhesion of fireproofing to substrate.

## SECTION 07 81 00 SPRAYED-ON FIREPROOFING

- D. Where necessary, cleaning or other corrections of surfaces to receive fireproofing shall be responsibility of the supplier of incompatible substrate.

### 3.2 PREPARATION

- A. Cover other Work which might be damaged by fall-out or overspray of fireproofing materials during application.
- B. Provide temporary enclosure as required to confine spraying operations, protect the environment and to ensure adequate ambient conditions for temperature and ventilation.
- C. Prior to application of fireproofing, clips, hangers, support sleeves and other attachments required to penetrate the fireproofing shall be in place.
- D. Ducts, piping, equipment or other suspended matter which would interfere with application of fireproofing materials shall not be positioned until fireproofing Work is complete.
- E. Metal Roof Decks: application of fireproofing to underside of metal roof decks shall not commence until roofing is completely installed and tight, all penthouses are complete, all mechanical units have been placed, and construction roof traffic has ceased.

### 3.3 INSTALLATION

- A. Manufacturer's Instructions: Comply with manufacturer's instructions for type of material and condition of substrate in each case.
  - 1. Consult with manufacturer's technical representative at Project Site to determine proper procedure for conditions not fully covered by printed instructions.
  - 2. Record in writing oral instructions received, with copy to Architect and manufacturer.
- B. Use spray equipment of type recommended by fireproofing manufacturer.
- C. Extend material full thickness over entire substrate to be covered, in a monolithic blanket of uniform texture.
- D. Apply exposed sprayed fire-resistive material to produce the following finish: Spray-textured finish with no further treatment.
- E. Where full-height partitions terminate at bottom of beams and flutes of metal decking run perpendicular to beams, provide additional fireproofing material to fill flutes of deck above beams.
  - 1. Fill in deck gaps at beam connections where beams are used as partition closures.
- F. Refer to architectural details on Drawings for special conditions where sprayed-on fireproofing may be shown.
- G. Work Damaged by Weather: Remove and replace as required at no additional cost to Owner.
  - 1. Temporary protection from weather may be provided at Contractor's option.
- H. Cutting and Patching: Recoat fireproofing material that has been removed by other trades for installation of new beams in existing building.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
  - 1. Testing and inspecting agency will interpret tests and state in each report whether tested Work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of completed applications of sprayed fire-resistive material shall take place in successive stages, in areas of extent and using methods as follows.
  - 1. Do not proceed with application of sprayed-on fire-resistive material for next area until test results for previously completed applications of sprayed-on fire-resistive material show compliance with requirements.
  - 2. Tested values must equal or exceed values indicated and required for approved fire-resistance design.
- C. Remove and replace applications of sprayed-on fire-resistive material where test results indicate that it does not comply with specified requirements for cohesion and adhesion, for density, or for both at no additional cost to Owner.

## SECTION 07 81 00 SPRAYED-ON FIREPROOFING

- D. Apply additional sprayed-on fire-resistive material per manufacturer's written instructions where test results indicate that thickness does not comply with specified requirements at no additional cost to Owner.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional Work with specified requirements.

### 3.5 CLEANING & REPAIR

- A. Cleaning: Immediately upon completion of spraying operations in each containable area of Project, remove over-spray and fall-out of materials from surfaces of other Work and clean exposed surfaces to remove evidence of soiling.
  - 1. Use cleaning products and methods that are compatible with substrate to be cleaned.
- B. Coordinate installation of fireproofing with other Work in order to minimize need for other trades to cut or remove fireproofing.
  - 1. As other trades successively complete installation of their Work, maintain protection of structure afforded by fireproofing by patching any areas which have been removed or damaged prior to concealment of fireproofing by other Work.
- C. Repair or replace Work which has not been successfully protected.

END OF SECTION





## SECTION 07 81 02 PATCHING EXISTING SPRAYED-ON FIREPROOFING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Patching existing sprayed-on fireproofing that has been damaged or removed for installation of new Work as required in accordance with the Contract Documents.
- B. Submittals.
- C. Warranty.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES.
- C. Section 07 81 00 - SPRAYED ON FIREPROOFING: for definitions of "Structural Frame" and "Secondary Members" and performance requirements.

#### 1.3 REFERENCES

- A. As specified under Section 07 81 00.

#### 1.4 QUALITY ASSURANCE

- A. Install matching sprayed-on fireproofing system components by same manufacturer as existing sprayed-on fireproofing system such that new Work will not void current warranty of existing sprayed-on fireproofing.
- B. Installer: A firm which is approved or licensed by manufacturer of sprayed-on fireproofing materials.
- C. Verify required fire-ratings for member or material to receive sprayed-on fireproofing. See referenced definitions and performance requirements specified under Section 07 81 00.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Existing Sprayed-On Fireproofing Data Sheet: Submit completed Form to Architect at Project Preconstruction Meeting.
- C. Inspection Report: Copy of roofing system manufacturer's Inspection Report of completed roofing installation.

#### 1.6 WARRANTY

- A. Manufacturer's Warranty: Upon successful completion of the Work to the manufacturer's satisfaction and receipt of Final Payment, letter from manufacturer stating specifically that completed Work is installed in accordance with manufacturer's recommendations and that the Work does not adversely affect the Warranty of the existing sprayed-on fireproofing installation.
- B. Installer Warranty: The Installer shall supply the Owner with a separate five (5) year workmanship warranty. In the event any Work related to patching of sprayed-on fireproofing is found to be within the warranty term, defective or otherwise not in accordance with the Contract Documents, the Installer shall repair that defect at no cost to the Owner. The Installer's warranty obligation shall run directly to the Owner, and a copy shall be sent to the manufacturer.
- C. Owner Responsibility: Owner shall notify the sprayed-on fireproofing manufacturer and the Installer of any defects as they occur during the time period when both manufacturer's and Installer's warranties are in effect.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Sprayed-On Fireproofing Products: Match system component products by same manufacturer as existing sprayed-on fireproofing system.

#### 2.2 MISCELLANEOUS MATERIALS

- A. Acceptable to primary sprayed-on fireproofing materials manufacturer.

## SECTION 07 81 02 PATCHING EXISTING SPRAYED-ON FIREPROOFING

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Protect finish Work and adjacent materials during spraying operations.
- B. Surfaces to receive sprayed-on fireproofing shall be clean and free of loose dirt.
- C. Comply with manufacturer's instructions for preparation of substrate to receive sprayed-on fireproofing.

#### 3.2 INSTALLATION

- A. Comply in strict accordance with manufacturer's repair and installation instructions and guide Specification.

#### 3.3 COMPLETION

- A. Prior to demobilization from the Site, the Work shall be reviewed by the Contracting Officer and the Installer. All defects and non-compliance with the Specifications or the recommendations of the sprayed-on fireproofing manufacturer shall be itemized in a Punch List. These items must be corrected immediately by the Installer to the satisfaction of the Contracting Officer prior to demobilization.

END OF SECTION

## SECTION 07 81 02 PATCHING EXISTING SPRAYED-ON FIREPROOFING

## SECTION 07 81 02

## EXISTING SPRAYED-ON FIREPROOFING DATA SHEET

## 1.1 PROJECT DATA

Project Title:	
Project Address:	
Architect's Project No.:	

## 1.2 EXISTING WARRANTY DATA

Name of Sprayed-On Fireproofing Materials Manufacturer:	
Name of Sprayed-On Fireproofing Materials Installer:	
Date Warranty Commenced for Current Installation:	
Length of Warranty Period (years):	

## 1.3 EXISTING SPRAYED-ON FIREPROOFING PRODUCT DATA

Description	Manufacturer's Product
Sprayed-On Fireproofing	
Accessories (list all)	

## 1.4 ATTACHMENTS

- A. Attach copies of the following:
1. Product Data sheets for all roofing system component products.

Note: Obtain data for this Form from Owner's Operation & Maintenance Manuals.



## SECTION 07 84 13 PENETRATION FIRESTOPPING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide penetration firestopping in accordance with Contract Documents.
- B. Coordinate Work of this Section with Work of other Sections to properly execute Work and maintain hourly fire-resistance ratings of walls and floors where penetration firestopping systems are applied.
- C. Protect all penetrations in fire-rated floor and wall assemblies, both blank (empty) and those accommodating penetrating items such as cables, conduits, pipes and including ducts which are not shown to have fire or combination smoke / fire dampers. Penetrations in concrete slab-on-grade do not require protection.
- D. Protect top perimeters of fire-rated partitions.
- E. Where indicated on Drawings.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittals for Architect's review.
- C. Section 01 36 00 - DELEGATED DESIGN REQUIREMENTS: Submittal to Building Official.
- D. Section 09 21 16 - GYPSUM BOARD ASSEMBLIES.
- E. Division 21 - FIRE PROTECTION.
- F. Divisions 22-28: Mechanical, plumbing and electrical Work.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- B. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.

#### 1.4 QUALITY ASSURANCE

- A. Standards: The materials shall have been tested by UL or a recognized testing agency in accordance with one or more of the following, as applicable, or have current ICC-ES approval and acceptance by the Building Official.
  - 1. ASTM E814.
- B. Governing Code: IBC Chapter 7.
- C. Installer Qualifications: The Work may be installed by one or several installers provided the materials are consistent with the coordinated Submittal.

#### 1.5 REGULATORY REQUIREMENTS

- A. Minimum Required Fire (F) and Temperature (T) Ratings:
  - 1. Structural floor slabs, shafts:
    - a. 2F, 2T if exposed.
    - b. 2F if penetration occurs inside a wall.
  - 2. Two hour fire-rated partitions and walls: 2F.
  - 3. Smoke partitions: Smoke seal sealant or compound.

#### 1.6 DEFERRED SUBMITTAL (See Definition under Section 01 42 00):

- A. Submit under the provisions of Section 01 33 00.
- B. Coordinated Submittal: All trades who penetrate fire-rated assemblies shall be responsible for installation of penetration firestopping systems in accordance with a Bidder-designed single unified Submittal as follows:
  - 1. Product Data: Provide product characteristics, performance, limitation criteria and testing approvals to indicate compliance with Project requirements.
  - 2. Penetration details: Provide manufacturer's installation instructions and details.

## SECTION 07 84 13 PENETRATION FIRESTOPPING

3. Matrix: Provide matrix describing penetration firestopping systems as follows. Do not use more than one product for similar applications.
  - a. Acceptable Matrix Format: See sample Matrix at end of this Section.
  - b. Verify and state on Matrix that "there are no penetrations requiring a 2F / 2T rating."
4. Approvals: Architect will review Submittal for completeness and will verify that proposed through-penetration protection systems are appropriate. Provided the Submittal is complete and satisfactory, submit to Building Official under the provisions of Section 01 36 00. Distribute copies of approved Submittal to all trades whose Work penetrates fire-rated walls and floors.
  - a. Engineered equivalents may be required for 2T designs for non-combustible pipe penetrations. In that case, provide manufacturer's engineered design(s) with appropriate documentation for Building Official approval.

### 1.7 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Deliver material in the manufacturers' original, unopened containers or packages with manufacturer's name, product identification, lot numbers, UL labels and mixing and installation instructions, as applicable.
- B. All protection system materials shall be installed prior to expiration of shelf life.

### 1.8 PROJECT CONDITIONS

- A. Conform to manufacturer's printed instructions for installation and when applicable, curing in accordance with temperature and humidity.
  1. Conform to ventilation and safety requirements.
- B. Sequence Work to permit protection system materials to be installed and inspected prior to cover or being made inaccessible by subsequent construction.
- C. Where protection system materials are installed at locations which will remain exposed in the finished Work, select materials appropriate for the application or provide protection as necessary to prevent damage to adjacent surfaces and finishes, and protect as necessary against damage from other construction activities.
  1. Install protection system prior to painting so that the installation can be inspected and approved prior to painting.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Acceptable Manufacturers: 3M, no exceptions.
- B. Accessory Materials: Provide all ceramic blankets, non-combustible insulation and primer as required by test data to complete system installation.
- C. Duct Penetrations: Where ducts penetrate fire-rated and/or smoke assemblies but are not equipped with fire dampers, annular spaces around ducts shall be sealed against smoke penetration as recommended by the manufacturer and as approved by the Building Official.
- D. Tops of Rated Partitions: Seal with a combination of non-combustible insulation packing and fire-rated elastomeric caulking, mastic or spray.
  1. Joint sealant selected shall be capable of movement.
  2. Coordinate with type of deflection track used.

### 2.2 LIST OF PRODUCTS

- A. Select an appropriate system using one or more of the following approved 3M products:
  1. FireDam Spray 100
  2. FireDam 150 Caulk
  3. Fire Barrier FS-195+ Wrap Strip
  4. Fire Barrier Moldable Putty + (MP+)
  5. Fire Barrier Ultra Plastic Pipe Device (PPD)
  6. Interam Ultra GS Wrap

## SECTION 07 84 13 PENETRATION FIRESTOPPING

7. Fire Barrier Watertight Sealant 1000 NS
8. Fire Barrier Watertight Sealant 1003 SL
9. Fire Barrier Watertight Sealant 3000 WT
10. Fire Barrier Mortar
11. Fire Barrier Pillow - FB249, FB269, FB369
12. Fire Barrier Cast-In Devices
13. Fire Barrier CS-195+ Composite Sheet
14. Fire Barrier Sealant CP-25WB+
15. Fire Barrier 2000 Silicone Sealant
16. Fire Barrier 2000+ Silicone Sealant
17. Fire Barrier 2001 Silicone RTV Foam
18. Fire Barrier Sealant FD 150+
19. Expantrol Flexible Intumescent Seal (E-FIS)
20. Fire Block Sealant FB 136
21. Fire Barrier Marine Wrap
22. Fire Barrier Ultra RC Pack
23. Fire Barrier Sealant IC 15WB
24. E-5A-3 and E-5A-4 Mats
25. Fire Barrier Duct Wrap 15A
26. Fire Barrier Duct Wrap 20A
27. Fire Barrier Plenum Wrap 5A
28. Curtain Wall Insulation: Fiberglass or mineral wool depending on application.
29. Packing Material: 4 pcf density, mineral wool batt insulation, ASTM E1399.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which affect bond.
- C. Install backing materials to arrest liquid material leakage.

#### 3.2 APPLICATION

- A. Installation shall be performed in strict accordance with approved Submittal details.
- B. Coordinate plumbing, mechanical, electrical and other Work to assure that all pipe, conduit, ducts, cable and other items which penetrate fire-rated construction have been permanently installed prior to installation of penetration seals. Schedule and sequence the Work to assure that partitions, ceilings and other construction which would conceal penetrations are not erected prior to installation of penetration seals.
- C. Install non-combustible dams when required to properly contain protection materials within openings and as required to achieve required fire resistance rating.
- D. Finish surfaces of protection systems materials which are to remain exposed in the completed work to a uniform and level condition.
- E. Correct installations unacceptable to Building Official and provide additional protective measures as required to pass inspection.

#### 3.3 CLEANING

- A. Remove spilled and excess materials adjacent to penetrations without damaging adjacent surfaces.
- B. Leave finished Work in neat, clean condition with no evidence of spill overs or damage to adjacent surfaces.

END OF SECTION





## SECTION 07 92 00 JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide joint sealants in accordance with the Contract Documents.
- B. Where Required:
  - 1. Except as otherwise indicated, seal all exterior joints to make the entire building envelope weatherproof.
  - 2. Pre-compressed foam seismic joint seals in exterior walls.
  - 3. In addition, seal joints on the interior of the building as shown or indicated.
    - a. Where not otherwise indicated, seal joints between countertops and adjacent walls, wall-mounted plumbing fixtures and walls where required at recessed and surface-mounted equipment and substrate, and other locations to provide clean finished appearance and provide infection control.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data and samples.
- C. Section 03 30 00 - CAST-IN-PLACE CONCRETE: Preformed joint filler for concrete walks, sealing of control joints on interior slab on grade
- D. Section 06 40 00 - ARCHITECTURAL WOODWORK: Sealing countertops.
- E. Section 07 84 13 - PENETRATION FIRESTOPPING: Sealing of sleeves in fire rated floors and walls for mechanical and electrical penetrations
- F. Section 08 51 00 - ALUMINUM WINDOW WALLS & ENTRANCES: Sealing of window wall.
- G. Section 08 63 00 - METAL-FRAMED SKYLIGHTS: Sealing of skylights.
- H. Section 08 80 00 - GLAZING: Glass to glass or metal to glass sealants.
- I. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: Acoustical sealants.
- J. Section 09 30 00 - TILING: Sealing joints in ceramic tile.
- K. Division 22 - PLUMBING: Sealing surrounds of plumbing fixtures.

#### 1.3 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. ASTM C920, Standard Specification for Elastomeric Joint Sealants.

#### 1.4 QUALITY ASSURANCE

- A. General Performance: Except as otherwise indicated, joint sealants are required to establish and maintain waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealants to comply with this requirement will be recognized as failures of materials and workmanship.
- B. Warranty: Submit a written warranty agreeing to repair or replace joint sealants which have failed to provide watertight joints for any reason, or which appear to have failed in adhesion, cohesion, abrasion resistance, stain resistance or any other form of apparent deterioration (excluding limitations clearly specified in the manufacturer's product data). Period of warranty shall be 2 years, and the warranty shall be signed by installer and Contractor. All repair or replacement Work shall comply with these Specifications.
- C. Reference Standards: Sealant types are referenced to ASTM C920.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product specifications, handling, installation, and curing instructions, and performance tested data sheets for each elastomeric product required.
- C. Samples: Submit the following in duplicate:
  - 1. Manufacturer's standard color chips for Architect's color selection or verification.

## SECTION 07 92 00 JOINT SEALANTS

2. Upon Architect's preliminary color selection of pre-compressed seismic joint seal, submit actual samples of selected color(s).

### 1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
  1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 degrees F.
  2. When joint substrates are damp or rain is anticipated within 12 hours after application.
  3. Installation in cold weather: If job progress or any other condition requires installation of joint sealants in temperature that is below the minimum as stated in the manufacturer's printed literature, consult the manufacturer's representative and establish the minimum provisions required to ensure satisfactory Work. Record in writing, to the manufacturer with copy to the Architect, the conditions under which such installation must proceed, and the provisions made to ensure satisfactory Work.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joints widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates. Install joint sealants in concrete joints prior to application of paint coating.

### 1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver materials to project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants or other causes.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Elastomeric Joint Sealants:
  1. Type S1: Exterior sealant for brick and brick / precast concrete joints. Dow Corning 756. Special color and sanded texture to match colored mortar.
  2. Type S2: Exterior sealant for metal joints: Dow Corning 795. Color selected from manufacturer's standard and "special colors".
  3. Type S3: Typical traffic joint sealant. Two-component urethane sealant conforming to ASTM C920 Type M, Grade P, Class 25, uses T, M, A, O.
  4. Type S4: Typical interior sealant. Single-component polyurethane sealant. Except as otherwise indicated, for typical interior use except traffic joints, provide manufacturer's standard non-modified, one-part, polyurethane-based, air-curing, elastomeric sealant, complying with ASTM C920, Type S, Class 25.
- B. Pre-compressed Seismic Joint Seal: "Backerseal" (Greyflex) by Emseal Joint Systems, Ltd.
- C. Closed Cell Polystyrene Foam Backer Rod: Use one of the following:
  1. "Soft Type" by Industrial Thermo Polymers Limited.
  2. "Sof Rod" by Applied Extrusion Technology.
- D. Miscellaneous Materials:
  1. Joint primer / sealer: Provide type of joint primer / sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.
  2. Bond breaker type: Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.

## SECTION 07 92 00 JOINT SEALANTS

- E. Sand: Clean sand for applying to sealant at masonry construction.
  - 1. Color: As selected by Architect.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Installer shall examine joint surfaces and conditions under which joint sealant Work is to be performed, and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with joint sealant Work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

#### 3.2 JOINT PREPARATION

- A. Clean joint surfaces and remove protective coating which might interfere with bond of joint sealants. Except for stained concrete, do not apply elastomeric sealants to joint surfaces previously treated with paint, sealer, curing compound, elastomeric coating, water repellent or other coatings unless a laboratory test for durability of bond has been successfully completed by the manufacturer.
- B. Prime joint surfaces in horizontal concrete joints, except stained concrete, and where indicated, and where recommended by sealant manufacturer. Confine primer / sealer to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.

#### 3.3 INSTALLATION

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified and except where manufacturer's technical representative directs otherwise in writing.
- B. Set joint filler units at depth or position in joint as indicated to coordinate with other Work, including installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between ends of joint filler units.
- C. Install sealant backer rod for vertical sealants and where shown.
- D. Install bond breaker tape where required by manufacturer's recommendations to ensure that sealants will perform as intended.
- E. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt. Pour joints in horizontal surfaces flush with adjacent surfaces.
- F. Install sealant to depths as shown, or if not shown, as recommended by sealant manufacturer, but within the following general limitations measured at center (thin) section of beads (not applicable to sealants in lapped joints).
  - 1. Fill joints to a depth equal to 50 percent of joint width, but neither more than 1/2 inch deep nor less than 1/4 inch deep.
- G. Tool all non-sag joints to neat, uniform profiles. Recessed joints shall be tooled flat with uniform depth of recess.
- H. Interior sealant joints, except traffic joints, will be painted over.
- I. Spillage: Do not allow sealants or compounds to overflow from confines of joints, or to spill onto adjoining work, or to migrate into voids of exposed finishes. Mask off edges of recessed joints. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

#### 3.4 INSTALLATION, PRE-COMPRESSED FOAM SEALANT

- A. Install with manufacturer supplied lubricant adhesive on one side of joint in accordance with manufacturer's printed instructions.
- B. Bond ends of pre-compressed foam sealants together with adhesive or "weld" by other means and recommended by manufacturer to ensure continuous watertight and airtight performance. Miter-cut and bond ends at corners unless molded corner units are provided.
- C. At exposed locations, recess joint and seal over with Type S2 sealant. Color of sealant may vary with adjacent materials.

## SECTION 07 95 15 EXPANSION JOINT COVER ASSEMBLIES

- D. Samples: Submit actual samples of interior wall and ceiling joint covers and samples of each color of insert available for Architect's color selection.

### PART 2 - PRODUCTS

#### 2.1 EXTERIOR SEISMIC JOINT COVERS

- A. Acceptable Manufacturers and Products: Subject to requirements provide products from one of the following:
  - 1. Basis of Design: C/S Group, [www.c-sgroup.com](http://www.c-sgroup.com).
  - 2. Michael Rizza Company, Inc., [www.michaelrizzacollc.com](http://www.michaelrizzacollc.com).
  - 3. Watson Bowman Acme, [www.wbacorp.com](http://www.wbacorp.com).
- B. SC-Series by C/S Group. Gap widths as indicated on Drawings.

#### 2.2 INTERIOR FLOOR, WALL & CEILING JOINT COVERS

- A. Acceptable Manufacturers and Products: As scheduled at end of this Section.

#### 2.3 FIRE BARRIER SYSTEM

- A. Acceptable Manufacturers and Products:
  - 1. Type FB-1: Compressible block of insulation housed in stainless steel foil. Basis of Design: Reflex by C/S Group, [www.c-sgroup.com](http://www.c-sgroup.com), for gaps 2 to 4 inches.
  - 2. Type FB-2: System of insulation layers encapsulated in stainless steel mesh. Basis of Design: Multiflex by C/S Group, [www.c-sgroup.com](http://www.c-sgroup.com), for gaps 5 to 20 inches.
- B. Fire barriers for use with or without cover assembly.
- C. Required Fire Rating:
  - 1. At Floors: 2-hours.
  - 2. At Walls and Partitions: 1 and 2-hours. Match rating of wall or partition assembly.

#### 2.4 ACCESSORY MATERIALS

- A. Fasteners:
  - 1. Exterior joints: Non-magnetic stainless steel.
  - 2. Interior joints: Self-drilling sheet metal screws or concrete anchors as recommended by manufacturer.
  - 3. Adhesive mounting: Sikaflex 1A urethane sealant. Use for attaching aluminum extrusion to side of joint where screw fastening is not possible or practical.
- B. Sealants: Types as recommended by manufacturer and compatible with joint materials and joint substrates.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Coordinate and furnish anchorages, Setting Drawings, templates and instructions for installation of expansion joint cover assemblies to be embedded in concrete or have recesses formed into edges of concrete slab for later placement and grouting-in of frames.

#### 3.2 INSTALLATION

- A. Fastening to In-Place Construction:
  - 1. Provide anchorage devices and fasteners where necessary for securing expansion joint cover assemblies to in-place construction, including threaded fasteners with drilled-in expansion shields for concrete where anchoring members are not embedded in concrete.
  - 2. Provide fasteners of metal, type and size to suit type of construction indicated and provide for secure attachment of expansion joints cover assemblies.
- B. Paint aluminum surfaces that contact concrete with zinc chromate primer or other approved means to prevent corrosion.

## SECTION 07 95 15 EXPANSION JOINT COVER ASSEMBLIES

- C. Cutting, Fitting & Placement:
1. Perform all cutting, drilling and fitting for installation of expansion joint covers.
  2. Install joint cover assemblies in true alignment and proper relationship to expansion joints and adjoining finished surfaces measured from established lines and levels.
  3. Allow adequate free movement for thermal expansion and contraction of metal to avoid buckling.
  4. Set floor covers at elevations to be flush with adjacent finished floor materials.
  5. Locate wall, ceiling, roof and soffit covers in continuous contact with adjacent surfaces.
  6. Securely attach in place with all required accessories. Locate anchors at interval recommended by manufacturer, but not more than 24 inches on centers.
- D. Joinery & Continuity:
1. Maintain continuity of expansion joint cover assemblies with end joints held to a minimum and metal members aligned mechanically using splice joints.
  2. Cut and fit ends to produce joints that will accommodate thermal expansion and contraction of metal to avoid buckling of frames.
  3. Adhere flexible filler materials to frames with adhesive or pressure sensitive tape as recommended by manufacturer.
- E. Exterior Seismic Seals: Install in continuous lengths and in accordance with manufacturer's instructions and seal all ends and corners. Install continuous guttering and make provisions to drain low point to exterior.
1. Remove exterior seals from existing joint covers where joints are extended vertically.
  2. If existing guttering and extrusions are not compatible with new, remove existing and replace with new to grade or bottom termination.
- F. Installed joint covers shall be neat and flush with adjacent surfaces and aligned with intersecting joint covers. Exterior joint covers shall be watertight.

### 3.4 SCHEDULE OF INTERIOR SEISMIC JOINT COVERS

SCHEDULE OF INTERIOR SEISMIC JOINT COVERS (Basis of Design and Quality Standard: C/S Group)						
Location Wing/Floor	Movement (inches)		Gap (inches)	Floor Joint Model No.	Wall Joint Model No.	Ceiling Joint Model No.
	E - W	N - S				
K-1	---	---	---	---	FWFC-200	FWFC-200
L-1	---	---	---	---	SF-200	SF-200
K-2	7/8	1/2	2	GFR-200	FWF-200	FWF-200
L-2	1-1/8	1-1/8	2-1/4	---	---	---
K-3	1-5/8	3/4	2	GFR-200	FWF-200	FWF-200
L-3	1-7/8	1-3/4	4	GFR-400	FWF-400	FWF-400
K-4	2-1/4	1-1/4	3	GFR-400	FWF-400	FWF-400
L-4	2-1/2	2-1/2	5	SGR-500	FWF-500	FWF-500
K-5	2-7/8	2	4	GFR-400	FWF-400	FWF-400
L-5	3-1/8	3-3/8	6	SGR-600	FWF-600	FWF-600
K-6	3-1/8	2-7/8	6	SGR-600	LAF-600	LAF-600
L-6	3-5/8	4-1/4	8	PCW-800	LAF-800	LAF-800
K-7	4	4-1/8	9	SGR-900	LAF-900	LAF-900
L-7	4-1/4	5-1/2	9	SGR-900	LAF-900	LAF-900
K-8	5	5-1/2	11	SGR-1100	LAF-1100	LAF-1100
L-8	5-1/4	7	11	SRG-1100	LAF-1100	LAF-1100

Notes:

1. K-Wing joints occur along grid line 1. L-Wing joints occur along grid line A.
2. Omit fire barrier material at ceiling joints.

END OF SECTION



## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL		FINISH	ASSEMBLY FIRE RATING	HDLR. GROUP	FRAME			DETAIL REFERENCE			NOTES
									TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
1ST FLOOR															
1000X	A	6'-0"x7'-0"		STL	P	NR	001	1	STL	P					3
1002X	A	6'-0"x7'-0"	P	STL	P	NR	001	1	STL	P					3
1003X	A	3'-0"x7'-0"	S	STL	P	90	002	1	STL	P					3
1004XA	A	3'-0"x7'-0"	S	STL	P	NR	002	1	STL	P					1, 3
1004XB	A	6'-0"x7'-0"	P	STL	P	NR	001	1	STL	P					1, 3
1005X	D	6'-0"x7'-0"	P	AL	FF	NR	003	6	AL	FF					1, 14, Side Light; Frame Dimension 8'-5 1/2"x7'-2"
1006X	A	6'-0"x7'-0"	P	STL	P	NR	001	1	STL	P					3
1011	A	3'-0"x7'-0"	S	WD	T	S	004	1	STL	P					1
1012	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P					13
1013	A	3'-0"x7'-0"	S	WD	T	S	005	1	STL	P					13
1014	B	7'-4"x7'-0"	P	V-WD	VC2	90S	006	7	STL	P					1, Double Egress
1015	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P					13
1016	A	3'-0"x7'-0"	S	STL	P	45S	007	1	STL	P					1
1017A	A	3'-0"x7'-0"	S	STL	P	45S	007	1	STL	P					1
1017B	A	3'-0"x7'-0"	S	STL	P	45S	007	1	STL	P					1
1022	M	8'-1"x7'-11"	P	STL	P	S	008	1	STL	P					9, Total Door
1024	A	3'-0"x7'-0"	S	WD	T	S	011	2	STL	P					
1025	A	3'-0"x7'-0"	S	WD	T	S	011	2	STL	P					
1028	U	4'-1"x7'-0"	S	V-WD	VC1	NR	010	11	STL	P					10, Rad Prctn With Lock
1029	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P					7
1030	A	5'-0"x7'-0"	P	STL	P	NR	012	1	STL	P					
1031	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P					7
1033	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P					
1036	A	3'-0"x7'-0"	S	STL	P	S	013	1	STL	P					1
1037A	A	3'-0"x7'-0"	S	WD	T	S	014	1	STL	P					1

## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
1037B	A	3'-0"x7'-0"	S	WD	T	S	014	1	STL	P				1
1038	D	3'-0"x7'-0"	S	AL	FF		015	6	AL	FF				5, Side Light; Frame Dimension 8'-0"x8'4 1/2"
1039	A	3'-0"x7'-0"	S	V-WD	VC2	S	014	1	STL	P				
1041	A	3'-0"x7'-0"	S	V-WD	VC2	45S	016	1	STL	P				
1042	A	3'-0"x7'-0"	S	STL	P	S	014	1	STL	P				1
1043	D	3'-0"x7'-0"	S	WD	T	S	014	1	STL	P				6
1044	A	3'-0"x7'-0"	S	STL	P	S	017	1	STL	P				
1045	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
1046	B	3'-0"x7'-0"	S	V-WD	VC2	NIR	018	1	STL	P				
1048	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1049	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1051	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1052	A	3'-0"x7'-0"	S	WD	T	45S	014	1	STL	P				1
1054	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1055	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1056	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1058	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1059	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1061	A	3'-0"x7'-0"	S	WD	T	S	014	1	STL	P				
1062	U	4'-2"x7'-0"	S	STL	P	S	010	11						10, Radiation Protection With Lock
1064	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
1066	A	3'-0"x7'-0"	S	WD	T	S	011	2	STL	P				
1067	A	3'-0"x7'-0"	S	WD	T	S	011	2	STL	P				
1072	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
1081	B	8'-6"x7'-0"	P	V-WD	VC2	20S	010	7	STL	P				9, Double Egress, Field Verify Dimensions
1082XA	B	3'-6"x7'-0"	S	STL	P	90S	020	1	STL	P				1



## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
1082B	B	3'-6"x7'-0"	S	STL	P	S	019	1	STL	P				
1083B	A	3'-0"x7'-0"	S	STL	P	90	021	1	STL	P				
1083XA	A	3'-0"x7'-0"	S	STL	P	45S	022	1	STL	P				
1084XA	B	6'-0"x7'-0"	P	STL	P	NR	024	1	STL	P				1
1084B	B	7'-4"x7'-0"	P	V-WD	VC2	90S	023	1	STL	P				1, 9, 10, AGV
1086	A	4'-0"x7'-0"	S	V-WD	VC2	60S	025	1	STL	P				10, AGV
1087	A	3'-0"x7'-0"	S	STL	P	S	026	1	STL	P				1
1088	A	4'-0"x7'-0"	S	V-WD	VC2	S	025	1	STL	P				10, Check Hardware, AGV
1089	A	3'-0"x7'-0"	S	STL	P	60S	027	1	STL	P				
1091X	A	6'-0"x7'-0"	P	STL	P	45S	028	1	STL	P				
1092A	A	3'-0"x7'-0"	S	STL	P	45S	018	1	STL	P				
1092B	A	3'-0"x7'-0"	S	STL	P	45S	029	1	STL	P				
1092XC	A	6'-0"x7'-0"	P	STL	P	NR	028	1	STL	P				
1093XA	A	3'-0"x7'-0"	S	STL	P	45S	022	1	STL	P				
1093XB	A	3'-0"x7'-0"	S	STL	P	45S	022	1	STL	P				
1094X	A	3'-0"x7'-0"	S	STL	P	45S	022	1	STL	P				
1095A	A	3'-0"x7'-0"	S	STL	P	NR	030	1	STL	P				
1095XB	A	3'-0"x7'-0"	S	STL	P	NR	031	1	STL	P				
1098X	B	3'-0"x7'-0"	S	STL	P	90	032	1	STL	P				1
1099	B	7'-4"x7'-0"	P	STL	P	NR	033	1	STL	P				1
E1112XA	-	5'-0"x7'-2"					010							Existing Sliding Glass Door
1112B	R	9'-9 1/2"x8'-9"	P	AL	FF		010		AL	FF				14, Automatic Sliding Glass Door with film pattern; Match Frame & Finish Door Dimensions of Existing Door E1112XA
1114	J	3'-6"x8'-8 1/4"	S	AL	FF		010	10	AL	FF				15, Glass Door With Glass Partition with film pattern; Frame/Track Dimension 8'-10"x8'-8 1/4"
1115	J1	3'-8"x8'-93/4"	S	AL	FF	S	010	10a	AL	FF				15, Glass Slider with film pattern; Frame/Track Dimension 6'-7 1/2"x8'-93/4"

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDLR. GROUP	FRAME			DETAIL REFERENCE			NOTES
							TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
1117	B	3'-0"x7'-0"	S	V-WD	VC2	S	034	1	STL	P			1
1118	A	3'-0"x7'-0"	S	WD	T	S							Verify Smoke Gasket; New Door, Existing Frame
E1119	-	3'-0"x7'-0"	S			S							Verify Smoke Gasket; Exist. Door
E1124	-	3'-0"x7'-0"	S	V-WD	VC1	S							Verify Smoke Gasket; Exist. Door
E1125	-	4'-0"x7'-0"	S	STL	P	S							Verify Smoke Gasket; Exist. Door
E1126	-	3'-0"x7'-0"	S			90							Verify Label & Gasket; Exist. Door
E1128	-	4'-0"x7'-0"	S	STP	P	S	010						Radiation Protection With Lock
E1129	-	4'-0"x7'-0"	S	STL	P	S	010						Radiation Protection With Lock
EX1131	-	3'-0"x7'-0"	S			S							Verify Smoke Gasket; Exist. Door
1161	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P			5
1162A	D	3'-0"x7'-0"	S	WD	T	S	035	1	STL	P			5
1162B	A	4'-0"x7'-0"	P	WD	T	NR	036		STL	P			Closet
1164	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P			5
1166	A	3'-0"x7'-0"	S	WD	T	S	011	2	STL	P			
1167	A	3'-0"x7'-0"	S	WD	T	S	011	2	STL	P			
1169	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P			13
1171	A	3'-0"x7'-0"	S	WD	T	S	011	2	STL	P			
1172	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P			5
1174	A	3'-0"x7'-0"	S	V-WD	VC2	S	014	1	STL	P			
1175	D	3'-0"x7'-0"	S	AL	FF	S	035	1	STL	P			5
1176	A	3'-0"x7'-0"	S	V-WD	VC2	60	037	1	STL	P			
1177	D	3'-0"x7'-0"	S	WD	T	S	035	1	STL	P			5
1181	B	3'-0"x7'-0"	S	WD	T	S	014	1	STL	P			1
1182	D	3'-0"x7'-0"	S	WD	T	S	035	1	STL	P			5
S0-1	-	3'-0"x7'-0"	S	V-WD	VC1	90		1					1, Existing Door; Card Reader New
S1-1	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P			1

SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
S2-1	A	3'-0"x7'-0"	S	V-WD	VC1	90	039	1	STL	P				1

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDLR. GROUP	FRAME			DETAIL REFERENCE			NOTES	
	TYPE								TYPE	MATERIAL	FINISH	HEAD	JAMB		THRESHOLD
2nd Floor															
2001A	-	16'-11"x13'-4 1/2"	P	AL	FF	NR	010	-	AL	FF					17, 18
2001XB	-	16'-4"x13'-4 1/2"	P	AL	FF	NR	010	-	AL	FF					17, 18
2008X	-	3'-0"x7'-0"	S	AL	FF	NR	040	-	STL	P					1, Storefront
2013	A	3'-0"x7'-0"	S	V-WD	VC1	NR	005	2	STL	P					13
2014	A	3'-0"x7'-0"	S	V-WD	VC1	NR	005	2	STL	P					13
2015	E	3'-4"x7'-4"	S	AL	FF	S	041	-	AL	FF					6
2016	B	7'-4"x7'-0"	P	V-WD	VC1	90	006	7	STL	P					1, 10
2017	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
2018	F	8'-7"x7'-4"	P	AL	FF	S	010	-	AL	FF					7
2021	F	8'-7"x7'-4"	P	AL	FF	S	010	-	AL	FF					7
2022	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
2023	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P					13
2024	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P					
2025	F	8'-7"x7'-4"	P	AL	FF	S	010	-	AL	FF					7
2026	N	4'-0"x7'-0"	S	V-WD	VC1	S	044	11	STL	P					Radiation Protection
2028A	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P					11
2028B	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P					11
2029A	N	3'-0"x7'-0"	S	STL	P	S	046	1	STL	P					Radiation Protection
2029B	N	3'-0"x7'-0"	S	STL	P	S	046	1	STL	P					Radiation Protection
2032	N	4'-0"x7'-0"	S	V-WD	VC1	S	044	11	STL	P					Radiation Protection
2033	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P					1
2034	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P					13
2035	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2037	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
2038	F	8'-7"x7'-4"	S	AL	FF	S	010		AL	FF					7

## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
2039	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2041	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
2042	A	3'-0"x7'-0"	S	V-WD	VC1	NR	005	2	STL	P				13
2043	A	3'-0"x7'-0"	S	V-WD	VC1	NR	005	2	STL	P				13
2045	E	3'-4"x7'-4"	S	AL	FF	S	041	-	AL	FF				6
2047	B	7'-4"x7'-0"	P	V-WD	VC1	90	006	7	STL	P				1, 10, Double Egress
2048A	L	4'-4"x7'-0"	S	WD	T	NR	010	8	STL	P				
2048B	J	4'-5"x9'-0"	S	AL	FF	NR	010	10a	AL	FF				16; Glass Partition/Frame Dimensions 10'-8"x9'-0"
2049A	E	3'-4"x7'-4"	S	AL	FF	S	035	-	AL	FF				7
2049B	A	3'-0"x7'-0"	S	WD	T	90	047	1	STL	P				
2049C	K	TBD	S	STL	P	S	010	-	STL	P				
2052A	L	4'-4"x7'-0"	S	WD	T	NR	010	8	STL	P				
2052B	J	4'-5"x9'-0"	S	AL	FF	NR	010	10a	AL	FF				16; Glass Partition/Frame Dimensions 15'-1"x9'-0"
2053	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P				13
2055A	B	4'-0"x7'-0"	S	V-WD	VC2	90	048	1	STL	P				1
2055B	B	4'-0"x7'-0"	S	V-WD	VC2	90	048	1	STL	P				1
2056	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
2058	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
2059A	L	4'-4"x7'-0"	S	WD	T	NR	010	8	STL	P				
2059B	J	4'-5"x9'-0"	S	AL	FF	NR	010	10a	AL	FF				16; Field Verify Dimensions
2061	A	3'-0"x7'-0"	S	STL	P	S	049	1	STL	P				
2062A	L	4'-4"x7'-0"	S	WD	T	NR	010	8	STL	P				Sliding Wood Door
2062B	J	4'-5"x9'-0"	S	AL	FF	NR	010	10a	AL	FF				16; Field Verify Dimensions
2063A	E	3'-4"x7'-4"	S	AL	FF	S	035	-	AL	FF				7
2063B	A	3'-0"x7'-0"	S	WD	T	90	047	1	STL	P				
2063C	K	TBD	S	STL	P	S	010	-	STL	P				Coiling Door

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES	
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD		
2064	A	4'-0"x7'-0"	S	V-WD	VC2	NR	050	1	STL	P					
2071	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2075	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2076	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2077	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2082A	E1	3'-4"x7'-4"	S	AL	FF	NR	052	-	AL	FF					13, Gasketed
2082B	E	3'-4"x7'-4"	S	AL	FF	NR	042	-	AL	FF					4
2082C	E	4'-4"x7'-4"	S	AL	FF	S	051	-	AL	FF					4, 19
2084	F	6'-9 1/2"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2085A	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					4, 19
2085B	E	3'-0"x7'-0"	S	AL	FF	NR	042	-	AL	FF					4
2085C	E1	3'-4"x7'-4"	S	AL	FF	NR	052	-	AL	FF					13, Gasketed
2087	M	8'-1"x7'-1"	S	STL	P	20S	010	-	STL	P					9
2088	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2089	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2091	E	4'-0"x7'-0"	S	AL	FF	S	042	-	AL	FF					7
2092	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2093	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2095	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
2096	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P					13
2097	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P					13
2098A	A	3'-0"x7'-0"	S	STL	P	S	017	1	STL	P					1
2098B	A	3'-0"x7'-0"	S	STL	P	S	017	1	STL	P					1
2099	M1	8'-1"X7'-1"	P	STL	P	20S	010	-	STL	P					9, Double Egress
2101A	C	3'-0"x7'-0"	S	STL	P	S	053	1	STL	P					1
2101B	B	3'-0"x7'-0"	S	STL	P	20S	054	1	STL	P					1

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDLR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
2101C	K	TBD	S	STL	P	S	010	-	STL	P				
2102	A	4'-0"x7'-0"	S	V-WD	VC2	S	055	1	STL	P				1
2103	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2104	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				
2105	A	3'-6"x7'-0"	S	STL	P	S	056	1	STL	P				
2106	B	7'-4"x7'-0"	P	V-WD	VC2	20S	006	7	STL	P				10
2109A	G	11'-8"x7'-4"	P	AL	FF	S	010	-	AL	FF				7
2109B	H	15'-0"x7'-4"	P	AL	FF	NR	010	-	AL	FF				5
2109C	G	11'-8"x7'-4"	P	AL	FF	S	010	-	AL	FF				7
2114	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2115	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2118A	E	4'-4"x7'-4"	S	AL	FF	S	051	-	AL	FF				4, 19
2118B	E	3'-4"x7'-4"	S	AL	FF	NR	042		AL	FF				4
2118C	E1	3'-4"x7'-4"	S	AL	FF	NR	052	-	AL	FF				13
2121	F	6'-9 1/2"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2122A	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				4, 19
2122B	E	3'-4"x7'-4"	S	AL	FF	NR	042	-	AL	FF				4
2122C	E1	3'-4"x7'-4"	S	AL	FF	NR	052	-	AL	FF				13
2123	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2124	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2128	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
2129	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P				13
2131	D	3'-0"x7'-0"	S	STL	P	S	004	1	STL	P				1, 5
2132	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2133	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				
2134A	A	4'-0"x7'-0"	S	V-WD	VC2	45S	057	1	STL	P				1

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
	TYPE	TYPE						TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
2134B	A	4'-0"x7'-0"	S	V-WD	VC2	45S	055	1	STL	P				1
2135	A	4'-0"x7'-0"	S	V-WD	VC2	60	025	1	STL	P				
2136	A	3'-0"x7'-0"	S	STL	P	45	058	1	STL	P				1
2137	A	4'-0"x7'-0"	S	V-WD	VC2	S	055	1	STL	P				
2138	B	7'-4"x7'-0"	P	V-WD	VC2	NR	060	7	STL	P				
2139	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P				13
2141	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
2142	D	3'-0"x7'-0"	S	STL	P	S	004	1	STL	P				1, 5
2143	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2145A	E	4'-4"x7'-4"	S	AL	FF	S	061	-	AL	FF				1, 4, 19
2145B	K	13'-0 1/4"x9'-0"	S	STL	P	NR	010	-						Coil Door
2146	E	4'-4"x7'-4"	S	AL	FF	S	062	-	AL	FF				1, 4, 19
2148A	E	4'-4"x7'-4"	S	AL	FF	S	062	-	AL	FF				1, 4, 19
2148B	K	13'-0 1/4"x9'-0"	S	STL	P	NR	010	-						Coil Door
2149	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2151	A	4'-0"x7'-0"	S	V-WD	VC2	45S	025	1	STL	P				
2152	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				
2153A	A	4'-0"x7'-0"	S	V-WD	VC2	45S	055	1	STL	P				1
2153B	A	4'-0"x7'-0"	S	V-WD	VC2	45S	057	1	STL	P				1
2154	E	4'-4"x7'-4"	S	AL	FF	S	062	-	AL	FF				1, 4, 19
2155	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2156	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				
2157	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2158	D	3'-0"x7'-0"	S	STL	P	S	004	12	STL	P				1, 5; Frame Dimension 6'-0"x7'-2"
2159	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				
2161A	H	15'-0"x7'-4"	P	AL	FF	NR	010	-	AL	FF				5; Field Verify



## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDMR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
2161B	G	11'-8"x7'-4"	P	AL	FF	S	010	-	AL	FF				7
2161C	G	11'-8"x7'-4"	P	AL	FF	S	010	-	AL	FF				7
2162	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				
2163	D	3'-0"x7'-0"	S	STL	P	S	004	1	STL	P				1, 5
2164	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P				
2165	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2166	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
2188A	B	7'-6"x7'-0"	S	V-WD	VC2		006	7	STL	P				
2188B	B	4'-0"x7'-0"	P	V-WD	VC2		065	1	STL	P				1
2192	B	7'-4"x7'-0"	P	V-WD	VC2		023	1	STL	P				1, 10
2196	B	7'-4"x7'-0"	P	V-WD	VC2	20S	023	1	STL	P				1, 10
2202	M1	8'-1"x7'-0"	P	STL	P	20S	010	7	STL	P				9, Field Verify Dimension
2215	B	7'-6"x7'-0"	P	WD	T	90	023	1	STL	P				Match Finish of Existing Doors
2251A	G	11'-8"x7'-4"	P	AL	FF	S	010	-	AL	FF				7
2251B	N	4'-0"x7'-0"	S	V-WD	VC2	NR	066	11						1, 5
2254A	G	11'-8"x7'-4"	P	AL	FF		010	-	AL	FF				7
2254B	H	15'-0"x7'-4"	P	AL	FF		010	-	AL	FF				5, Field Verify Dimensions
2254C	G	11'-8"x7'-4"	P	AL	FF		010	-	AL	FF				7
2258A	G	11'-8"x7'-4"	P	AL	FF		010	-	AL	FF				7
2258B	H	4'-3"x7'-4"	P	AL	FF		010	-	AL	FF				5
2258C	G	11'-8"x7'-4"	P	AL	FF		010	-	AL	FF				7
2261	D	3'-0"x7'-0"	S	STL	P		004	1	STL	P				1, 5
2262	A	4'-0"x7'-0"	S	V-WD	VC2	S	055	1	STL	P				
2264A	G	11'-8"x7'-4"	P	AL	FF		010	-	AL	FF				7
2264B	H	15'-0"x7'-4"	P	AL	FF		010	-	AL	FF				5
2264C	G	11'-8"x7'-4"	P	AL	FF		010	-	AL	FF				7

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDMR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
2265	A	4'-0"x7'-0"	S	V-WD	VC2	60	025	1	STL	P				
2266	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P				13
2267	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P				
2270	A	3'-0"x7'-0"	S	STL	P	S	004	1	STL	P				1
2271	D	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				1, 6
2274A	D	3'-0"x7'-0"	S	WD	T	S	014	1	STL	P				5
2274B	A	3'-0"x7'-0"	S	WD	T	90	067	1	STL	P				1
2275	A	3'-0"x7'-0"	S	WD	T	S	005	1	STL	P				13
2277	D	3'-0"x7'-0"	S	WD	T	S	014	1	STL	P				5
2278	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				5
2279	B	3'-0"x7'-0"	S	STL	P	S	004	1	STL	P				1
2281	A	3'-0"x7'-0"	S	STL	P	S	059	1	STL	P				1
2282	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				6
2283	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				6
2284	A	3'-0"x7'-0"	S	STL	P	45S	017	1	STL	P				1
2285A	-	16'-0"x8'-11 1/2"	P	AL	FF	NR	010	-	AL	FF				17, 20, Verify Field Dimensions
2285XB	-	16'-0"x8'-11 1/2"	P	AL	FF	S	010	-	AL	FF				1, 17, 20, Verify Field Dimensions
2287A	A	3'-0"x7'-0"	S	STL	P	S	068	1	STL	P				12
2287XB	A	3'-0"x7'-0"	S	STL	P	NR	069	1	STL	P				1, 3
2288	D	3'-0"x7'-0"	S	STL	P	S	070	1	STL	P				5
2289	A	3'-0"x7'-0"	S	STL	P	S	071	1	STL	P				1
2292	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P				13
2294	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
2296	N	6'-0"x7'-0"	P	V-WD	VC2	S	072	11						4'-0" Active; 2'-0" Inactive Leaf
2297A	A	3'-0"x7'-0"	S	STL	P	S	011	1	STL	P				

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE				SINGLE/PAIR	MATERIAL		FINISH	ASSEMBLY FIRE RATING	HDWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
	TYPE	THRESHOLD	JAMB	HEAD		MATERIAL	FINISH				TYPE	MATERIAL	FINISH				
2297B	N	3'-0"x7'-0"	S	STL	P	NR	046	11	STL	P							
2298	A	3'-0"x7'-0"	S	STL	P	NR	073	1	STL	P							
2299	A	4'-0"x7'-0"	P	V-WD	VC2	45S	072	1									
E2330X	A	4'-0" x 7'-0"	S	STL	P	90	085	1	STL	P						3	
S1-2A	A	4'-0"x7'-0"	S	V-WD	VC1	90	064	1	STL	P						1, 10	
S1-2XB	A	4'-0"x7'-0"	S	STL	P	90	063	1	STL	P						1, 3, 10	
S2-2	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P						1	

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDLR. GROUP	FRAME			DETAIL REFERENCE			NOTES
							TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
<b>3rd Floor</b>													
3001	B 7'-4"x8'-11"	P	V-WD	VC1	NR	010	7	STL	P				1, 10, Double Egress
3003	A 3'-0"x7'-0"	S	V-WD	VC1	NR	074	1	STL	P				
3004	A 3'-0"x7'-0"	S	V-WD	VC1	NR	074	1	STL	P				
3007	A 3'-0"x7'-0"	S	STL	P	NR	043	1	STL	P				
3014	A 5'-0"x7'-0"	P	WD	T	NR	075	1	STL	P				Closet
3016	D 3'-0"x7'-9"	S	WD	T	NR	011	12	AL	FF				6; Frame Dimensions 6'-0 1/2"x7'-11 1/2"
3017XA	M 8'-0"x8'-3"	P	CW		NR	076	-	AL	FF				1; Custom Wood Panel Exterior - Art Commission Pivot Door in Alum. Storefront
3017B	A 6'-11"x8'0"	P	WD	T	NR	010	1	STL	P				
3018	M 8'-0"x8'-3"	P	STL	P	NR	076	-	WD	T				Custom Wood Panel Toward Chapel Lobby 3017 - Art Commission Pivot Door in Wood Frame
3021A	A 3'-0"x7'-0"	S	STL	P	45S	077	1	STL	P				
3021B	K 25'-0"x8'-0"		STL	P	45S	010	-	STL	P				
3022A	B 3'-0"x7'-0"	S	STL	P	90	053	1	STL	P				1
3022B	K 3'-0"x4'-0"		STL	P	45S	010	-	STL	P				
3023	B 7'-4"x7'-0"	P	V-WD	WD	90	006	7	STL	P				1, 10
3024	B 3'-0"x7'-0"	S	STL	P	NR	078	1	STL	P				Relight
3025	A 4'-0"x7'-0"	S	STL	P	S	079	1						1
3026	E 4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7, Glass
3027	F 8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
3028	A 3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
3031	A 3'-0"x7'-0"	S	STL	P	S	005	1	STL	P				13
3032A	F 8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				4
3032B	E 3'-4"x7'-4"	S	AL	FF	NR	042	-	AL	FF				4
3033A	E1 3'-4"x7'-4"	S	AL	FF	NR	005	-	AL	FF				13, Patient Rescue Door
3033B	E1 3'-4"x7'-4"	S	AL	FF	NR	005	-	AL	FF				13, Patient Rescue Door

## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
3034	F	6'-6"x7'-0"	S	AL	FF	S	010	-	AL	FF				7
3036A	E	3'-4"x7'-4"	S	AL	FF	NR	042	-	AL	FF				4
3036B	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				4
3037	A	3'-6"x7'-0"	S	V-WD	FF	S	080	1	STL	P				1
3038	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
3039	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
3041	B	7'-4"x7'-0"	P	V-WD	FF	NR	060	7	STL	P				Double Egress
3042A	F	6'-9 1/2"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
3042B	E	3'-4"x7'-4"	S	AL	FF	NR	042	-	AL	FF				4
3043	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				4
3044	E1	3'-4"x7'-4"	S	AL	FF	NR	005	2	AL	FF				13
3045	A	3'-0"x7'-0"	S	STL	P	NR	043	1	STL	P				1
3047	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3048	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3049	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3051	A	3'-0"x7'-0"	S	STL	P	S	017	1	STL	P				1
3052	B	7'-4"x7'-0"	P	V-WD	VC1	90	006	7	STL	P				1, 10
3053A	A	3'-0"x7'-0"	S	STL	P	NR	081	1	STL	P				
3053B	J	4'-4 1/2"x9'-33/4"	S	AL	FF	NR	010	10	AL	FF				16; Frame Dimension 8'-6"x9'-33/4"
3054	B	3'-0"x7'-0"	S	STL	P	NR	011	1	STL	P				1
3055A	A	3'-0"x7'-0"	S	STL	P	NR	081	1	STL	P				
3055B	E	3'-4"x7'-4"	S	AL	FF	NR	042	-	AL	FF				7
3058A	E	3'-4"x7'-4"	S	AL	FF	NR	042	-	AL	FF				7
3058B	A	3'-0"x7'-0"	S	STL	P	NR	081	1	STL	P				
3059	B	3'-0"x7'-0"	S	STL	P	NR	011	1	STL	P				1
3061A	J	4'-4 1/2"x9'-33/4"	S	AL	FF	NR	010	10	AL	FF				16; Frame Dimension 8'-6"x9'-33/4"

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWDR. GROUP	FRAME				DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH		HEAD	JAMB	THRESHOLD	
3061B	A	3'-0"x7'-0"	S	STL	P	NR	081	1	STL	P					
3065	F	8'-0"x7'-0"	S	AL	FF	S	010	-	AL	FF					7
3066	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
3067	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
3073	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
3074	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
3075	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P					13
3077	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
3078	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
3082	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
3084	A	3'-0"x7'-0"	S	STL	P	S	082	1	STL	P					
3085	A	3'-0"x7'-0"	S	STL	P	45S	014	1	STL	P					1
3086	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7
3087	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
3090	A	3'-0"x7'-0"	S	STL	P	S	004	1	STL	P					1
3092	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF					7
3093	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P					11
3094	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P					13
3096	A	3'-0"x7'-0"	S	STL	P	NR	083	1	STL	P					13
3098	A	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P					
3099	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF					7, 10
3101	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P					13
3102	A	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P					
3103	A	3'-0"x7'-0"	S	STL	P	S	011	1	STL	P					
3104	B	7'-4"x7'-0"	P	V-WD	VC1	NR	045	7	STL	P					1
3105	A	3'-0"x7'-0"	S	STL	P	S	084	1	STL	P					

## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
3107	A	3'-0"x7'-0"	S	STL	P	90	056	1	STL	P				
3108	A	3'-0"x7'-0"	S	WD	T	S	005	1	STL	P				13
3109	A	3'-0"x7'-0"	S	WD	T	S	005	1	STL	P				13
3112	A	3'-0"x7'-0"	S	STL	P	S	005	1	STL	P				13
3113	D	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				6
3114	A	3'-0"x7'-0"	S	STL	P	S	011	1	STL	P				1
3115	D	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				6
3116	N	4'-0"x7'-0"	S	STL	P	S	044	11	STL	P				Radiation Protection
3117	N	4'-0"x7'-0"	S	V-WD	VC2	S	044	11	STL	P				Radiation Protection
3118	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
3119	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				11, Double Egress
3120	A	3'-0"x7'-0"	S	WD	T	S	005	1	STL	P				13
3121	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7, Glass Slider
3123	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3124	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
3127	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3128	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7, 13
3129	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3130	E1	3'-4"x7'-4"	S	AL	FF	NR	005	-	AL	FF				13
3131	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3132	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
3134	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				7, 13
3135	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3139A	A	4'-0"x7'-0"	S	V-WD	VC2	45S	055	1	STL	P				1
3139B	A	4'-0"x7'-0"	S	V-WD	VC2	45S	057	1	STL	P				1
3140	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7

## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
3141	B	4'-0"x7'-0"	S	V-WD	VC2	60	025	1	STL	P				
3142	A	3'-0"x7'-0"	S	STL	P	45	058	1	STL	P				1
3143	B	4'-0"x7'-0"	S	V-WD	VC2	45	055	1	STL	P				
3144	D	3'-0"x7'-0"	S	STL	P	S	004	1	STL	P				1, 5
3145	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P				
3146	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				Double Egress
3147	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
3148	F	8'-7"x7'-4"	S	AL	FF	S	010	-	AL	FF				7
3149	E	4'-4"x7'-4"	S	AL	FF	S	042	-	AL	FF				7
3150	B	7'-4"x7'-0"	P	V-WD	VC2	NR	045	7	STL	P				Double Egress
3151	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
3152	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P				1
3153	D	3'-0"x7'-0"	S	STL	P	S	059	1	STL	P				1, 5
3166	B	7'-4"x7'-0"	P	V-WD	VC1	90S	006	7	STL	P				Double Egress
S1-3	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P				1
S2-3B	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P				1
S2-3XA	A	3'-0"x7'-0"	S	STL	P	NR	085	1	STL	P				3
														1



## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE				SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
	TYPE	THRESHOLD	JAMB	HEAD						FINISH	MATERIAL	TYPE				
4th Floor																
4002	J	3'-4"x8'-11 3/4"	S	AL	FF	-	010	10A	AL	FF						15; Frame Dimension 14'-0"x8'-11 3/4"
4004	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P						13
4006	A	3'-6"x7'-2"	S	WD	T	S	010	1	STL	P						1
4007A	S	3'-0"x8'-0"	S	AL	FF	S	086	3	AL	FF						7; Frame Dimensions 8'-0"x7'-4" . Glass Transom Not Included in Frame Dimensions
4007B	S	3'-0"x7'-0"	S	AL	FF	S	086	3	AL	FF						7; 8'-4"x7'-4" Frame, Glass Transom Not Included in Frame Dimensions
4007C	A	3'-0"x7'-0"	P	WD	T	-		1	STL	P						Closet
4008	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P						6
4009	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P						6
4012	A	3'-0"x7'-0"	S	WD	T	-	005	2	STL	P						13
4014	S	4'-0"x7'-0"	S	AL	FF	S	042	3	AL	FF						7; 5'-9"x7'-4" Frame, Glass Transom Not Included in Frame Dimension
4015	S	4'-0"x7'-0"	S	AL	FF	S	042	3	AL	FF						7; 5'-9"x7'-4" Frame, Glass Transom Not Included in Frame Dimension
4017	A	3'-0"x7'-0"	S	WD	T	-	005	2	STL	P						13
4018	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P						6
4019	A	3'-0"x7'-0"	S	WD	T	-	005	2	STL	P						13
4022	S	4'-0"x7'-0"	S	AL	FF	S	042	3	AL	FF						7; 8'-4"x7'-4" Frame, Glass Transom Not Included in Frame Dimensions
4023	T	8'-0"x8'-11 1/2"	S	AL	FF	-	010	-	AL	FF						5
4025	A	3'-0"x7'-0"	S	STL	P	S	081	1	STL	P						
4027	A	3'-0"x7'-0"	S	WD	T	-	005	2	STL	P						13
4029	S	8'-0"x7'-0"	S	AL	FF	S	042	3	AL	FF						7; 8'-4"x7'-4" Frame, Glass Transom Not Included in Frame Dimensions
4031	T	8'-0"x8'-11 1/2"	S	AL	FF	-	010	-	AL	FF						5
4033	A	3'-0"x7'-0"	S	WD	T	-	005	2	STL	P						13

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
4035	S	4'-0"x7'-0"	S	AL	FF	S	042	3	AL	FF				7; 8'-4"x7'-4" Frame, Glass Transom Not Included in Frame Dimensions
4036	T	8'-0"x8'-11 1/2"	S	AL	FF	-	010	-	AL	FF				5
4037	A	3'-0"x7'-0"	S	WD	T	-	005	2	STL	P				13
4039	M1	8'-1"x8'-11 1/2"	P	STL	P	20S	010	7	STL	P				
4041A	A	3'-0"x7'-0"	S	WD	T	S	053	1	STL	P				1
4041B	C	3'-0"x7'-0"	S	STL	P	-	087	1	STL	P				5
4041C	K	TBD	S	STL	P	S	010							
4043	C	3'-0"x7'-0"	S	STL	P	-	088	1	STL	P				5, 10
4044	C	3'-0"x7'-0"	S	STL	P	-	089	1	STL	P				5, 10
4046	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				6, Sound Seal
4051	A	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				
4052	A	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				
4053	B	3'-0"x7'-0"	S	WD	T	S	090	1	STL	P				
4060	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P				1
4062	S	4'-0"x7'-0"	S	AL	FF	S	042	3	AL	FF				7; 8'-4"x7'-4" Frame, Glass Transom Not Included in Frame Dimensions
4063	T	8'-0"x8'-11 1/2"	S	AL	FF	NR	010	-	AL	FF				5
4064	A	4'-0"x7'-0"	S	STL	P	45S	017	1	STL	P				1
4065	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4066	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4067	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4068	S	4'-0"x7'-0"	S	AL	FF	S	042	6	AL	FF				7; 5'-11"x8'-11 1/2" Frame Dimensions
4071	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
4072	A	3'-0"x7'-0"	S	WD	T	NR	005	2	STL	P				13
4073	A	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				
4074	S	4'-0"x7'-0"	S	AL	FF	S	042	6	AL	FF				7; 5'-11"x8'-11 1/2" Frame Dimensions
4077	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				

## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDMR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
4081	A	3'-0"x7'-0"	S	WD	T	S	005	2	STL	P				13
4082	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4083	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4084	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4086	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
4088	S	3'-0"x7'-0"	S	AL	FF	S	042	6	AL	FF				6; 8'-0"x8'-11 1/2" Frame Dimensions
4092	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4093	S	4'-0"x7'-0"	S	AL	FF	S	042	6	AL	FF				7; 5'-11"x8'-11 1/2" Frame Dimensions
4094	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4096	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
4098	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4101	A	3'-0"x7'-0"	S	WD	T	NR	005	2	STL	P				13
4102	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
4103	A	3'-0"x7'-0"	S	STL	P	S	043	1	STL	P				
4105	S	4'-0"x7'-0"	S	AL	FF	S	042	6	AL	FF				7; 5'-11"x8'-11 1/2" Frame Dimensions
4106	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4107	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4108	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4109	B	7'-4"x7'-0"	P	V-WD	VC1	90	023	1	STL	P				1, 10
4111	A	3'-0"x7'-0"	S	STL	P	S	092	1	STL	P				
4112	A	3'-0"x7'-0"	S	STL	P	45	034	1	STL	P				
4113	A	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				
4114	A	3'-0"x7'-0"	S	WD	T	NR	005	1	STL	P				13
4115	A	3'-0"x7'-0"	S	WD	T	NR	005	1	STL	P				13
4116	D	3'-0"x7'-0"	S	V-WD	VC1	NR	093	1	STL	P				6, Closer

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
4119	B	3'-0"x7'-0"	S	WD	T	S	004	1	STL	P				1
4122	D	3'-0"x7'-0"	S	WD	T	S	011	1	STL	P				6
4123	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4124	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4125	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4128	A	3'-0"x7'-0"	S	WD	T	NR	005	2	STL	P				13
4129	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4133	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
4134	A	3'-0"x7'-0"	S	WD	T	NR	011	1	STL	P				
4136	S	4'-0"x7'-0"	S	AL	FF	S	042	6	STL	P				7; 5'-11"x8'-11 1/2" Frame Dimensions
4137	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4138	A	3'-0"x7'-0"	S	WD	T	NR	091	1	STL	P				
4139	A	4'-0"x7'-0"	S	WD	T	NR	094	1	STL	P				
4145	A	3'-0"x7'-6"	S	WD	T	NR	011	1	STL	P				
4146	A	3'-0"x7'-6"	S	WD	T	NR	095	1	STL	P				
4147	A	3'-0"x7'-0"	S	V-WD	VC1	NR	011	1	STL	P				1
4148	M1	8'-1"x8'-11"	P	STL	P	20S	010	7	STL	P				9
4149	A	3'-0"x7'-0"	S	WD	T	S	095	1	STL	P				
4151	B	4'-0"x7'-0"	S	V-WD	VC2	60	098	1	STL	P				
4152	A	3'-0"x7'-0"	S	STL	P	S	097	1	STL	P				1
4153	A	3'-0"x7'-0"	S	WD	T	S	095	1	STL	P				
4154	B	4'-0"x7'-0"	S	V-WD	VC2	S	055	1	STL	P				
4155	A	3'-0"x7'-0"	S	WD	T	S	005	1	STL	P				13
4156	A	3'-0"x7'-0"	S	WD	T	S	005	1	STL	P				13
4157	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
4158	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				

SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDWR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
4159	A	3'-0"x7'-0"	S	WD	T	S	009	1	STL	P				
4166	B	7'-4"x8'-0"	P	STL	P	90	023	1	STL	P				1, 9
4181	A	7'-4"x7'-0"	P	V-WD	VC1	S	023	1	STL	P				1, 10
S1-4	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P				1, 10
S2-4	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P				1

## SECTION 08 06 00 DOOR SCHEDULE

MARK	DOOR SIZE				SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDWR. GROUP	FRAME			DETAIL REFERENCE			NOTES	
	TYPE	TYPE	TYPE	TYPE						TYPE	TYPE	TYPE	TYPE	TYPE	TYPE		TYPE
5th Floor																	
5001A	A	3'-0"x7'-0"	S	STL	P	NR	017	1	STL	P							
5001XB	A	3'-0"x7'-0"	S	STL	P	NR	099	9	STL	P						3, 12	
5003A	A	2'-6"x7'-0"	S	STL	P	NR	099	9	STL	P						3	
5003B	A	2'-6"x7'-0"	S	STL	P	NR	099	9	STL	P						3	
5003C	A	2'-6"x7'-0"	S	STL	P	NR	099	9	STL	P						3	
5003D	A	2'-6"x7'-0"	S	STL	P	NR	099	9	STL	P						3	
5003XE	A	2'-6"x7'-0"	S	STL	P	NR	099	9	STL	P						3, 12	
5004	A	2'-6"x7'-0"	S	STL	P	NR	099	9	STL	P						3	
5005X	A	3'-0"x7'-0"	S	STL	P	NR	099	9	STL	P						3, 12	
5007A	A	3'-0"x7'-0"	S	STL	P	45	100	1	STL	P							
5007B	A	7'-4"x7'-0"	P	STL	P	45	101	1	STL	P							
5009A	A	7'-4"x7'-0"	P	STL	P	45	102	1	STL	P							
5009XB	A	6'-0"x7'-0"	P	STL	P	NR	099	9	STL	P						3, 12	
5011	A	3'-0"x7'-0"	S	STL	P	S	092	1	STL	P							
5012	A	6'-0"x7'-0"	P	STL	P	90S	096	1	STL	P							
5014	B	8'-6"x7'-0"	P	STL	P	S	010	7	STL	P						9	
5020	A	3'-0"x7'0"	S	WD	T	NR	011	1	STL	P							
5022	A	3'-0"x7'-0"	S	W	T	45S	017	1	STL	P							
5023	B	6'-0"x7'-0"	P	V-WD	VC1	S	023	1	STL	P						1, 10	
S1-5	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P						1	
S2-5	A	3'-0"x7'-0"	S	V-WD	VC1	90	049	1	STL	P						1	

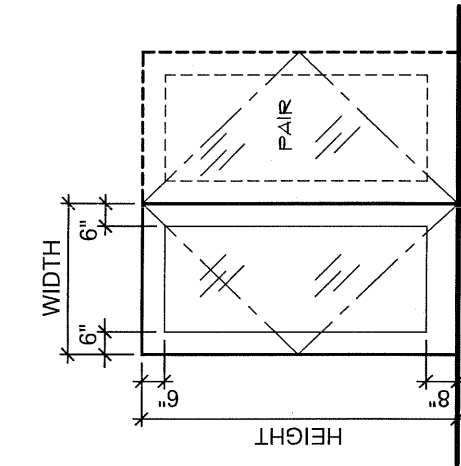
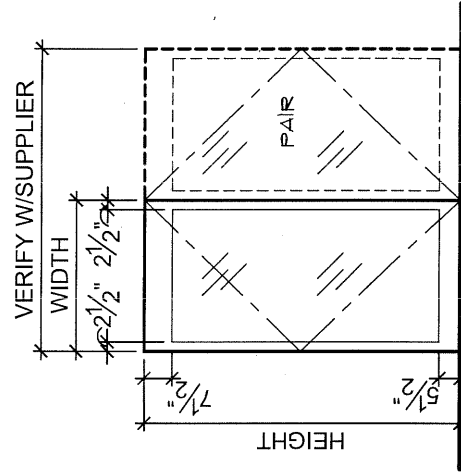
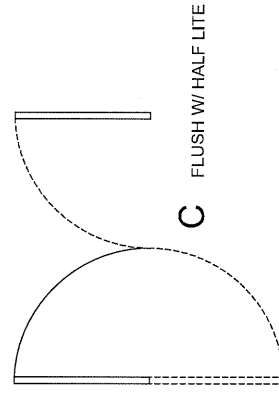
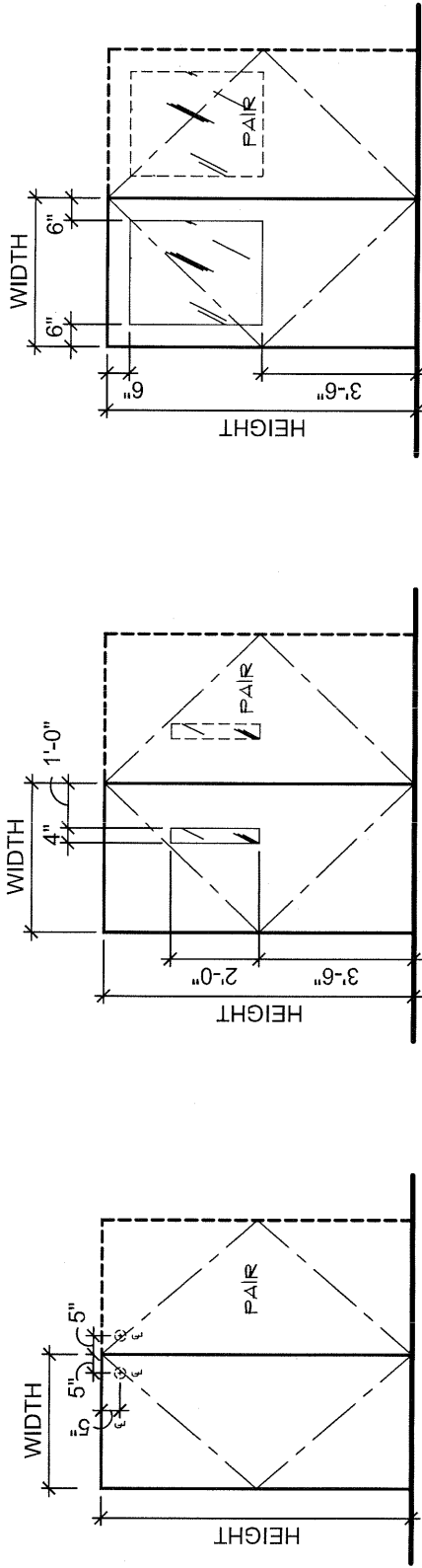
## SECTION 08 06 00 DOOR SCHEDULE

MARK	TYPE	DOOR SIZE	SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING	HDLR. GROUP	FRAME			DETAIL REFERENCE			NOTES
								TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	
6-9th Floors														
6001X	A	3'-0"x7'-0"	S	STL	P	NR	099	9	STL	P				3, 12
6002	A	3'-0"x7'-0"	S	STL	P	S	092	1	STL	P				
6003A	A	3'-0"x7'-0"	S	STL	P	45S	017	1	STL	P				1
6003XB	A	3'-0"x7'-0"	S	STL	P	45	099	9	STL	P				3, 12
6004A	A	3'-0"x7'-0"	S	STL	P	NR		1	STL	P				1
6014	C	3'-0"x7'-0"	S	WD	T	S	007	1	STL	P				5; Match Finish of Doors to Patient Room E6011
6015	B	7'-4"x7'-0"	P	V-WD	VC1	S	023	1	STL	P				1, 10
S1-6	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P				1
7th Floor														
7001	A	3'-0"x7'-0"	S	STL	P	S	092	1	STL	P				
7002	A	3'-0"x7'-0"	S	STL	P	45S	017	1	STL	P				
7007	M1	8'-0 1/2"x8'-5"	P	STL	P	20S	010	-	STL	P				9, Double Egress, Field Verify Dimensions
S1-7	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P				1
8th Floor														
8001	A	3'-0"x7'-0"	S	STL	P	45S	017	1	STL	P				1
S1-8	A	3'-0"x7'-0"	S	V-WD	VC1	90	038	1	STL	P				1
9th Floor														
9003B	A	3'-0"x7'-0"	S	STL	P	90	049	1	STL	P				
9003XA	A	3'-0"x7'-0"	S	STL	P	NR	099	9	STL	P				3, 12
S1-9	A	3'-0"x7'-0"	S	STL	P	90	049	1	STL	P				1

## SECTION 08 06 00 DOOR SCHEDULE

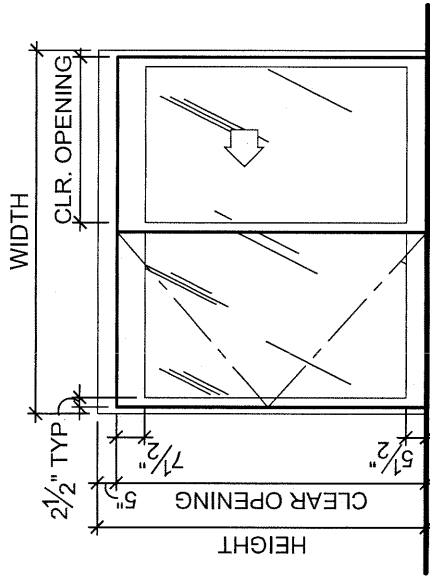
MARK	DOOR SIZE		SINGLE/PAIR	MATERIAL	FINISH	ASSEMBLY FIRE RATING			HWR. GROUP	FRAME				DETAIL REFERENCE			NOTES	
						TYPE	GENERAL NOTES:	THRESHOLD		JAMB	HEAD							



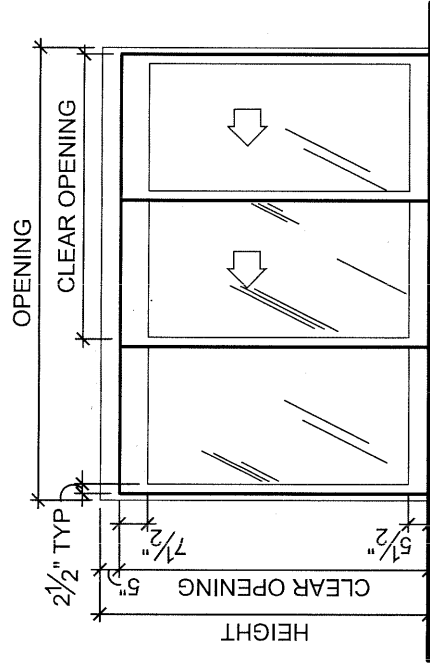


NOTES:  
1. MAGNETIC HOLD-OPEN, WHERE OCCURS

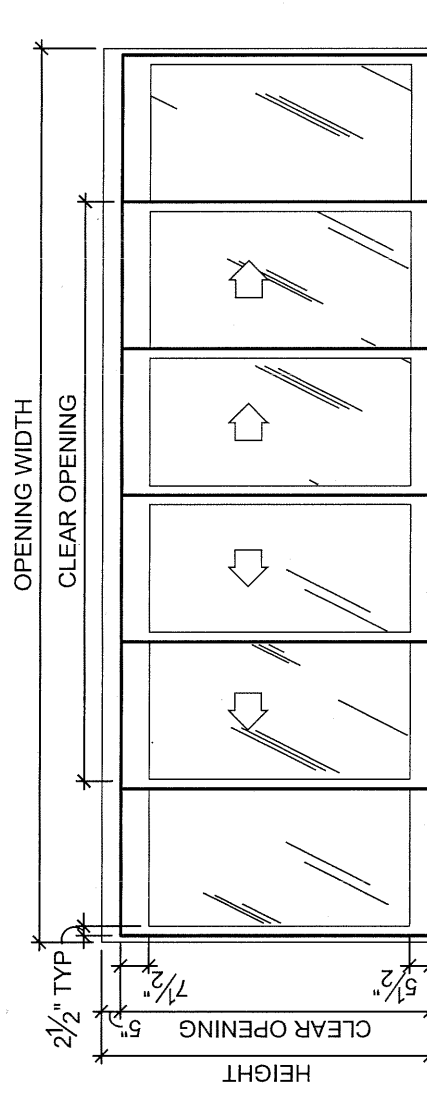
**E** FLUSH W/ FULL LITE  
(MATCHES ICU/CCU)  
**E1** FLUSH DOOR/FRAME  
W/SOLID PANEL (MATCHES  
ICU/CCU)



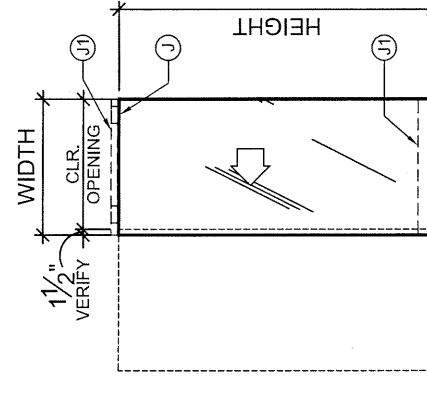
F ICU/CCU 2-PANEL DOOR/FRA...  
WITH BREAKOUT



G ICU/CCU 3-PANEL  
DOOR/FRA...



H ICU/CCU 6-PANEL DOOR/FRA...



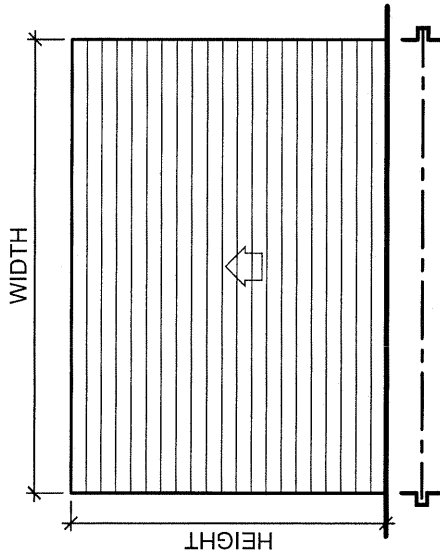
J TOP SUPPORTED FULL  
GLASS SLIDER, TRACKLESS  
J1 GLASS SLIDER, W/ BOTTOM TRACK,  
ALUM. EDGE PROTECTIVE STILES

DOOR TYPES

MMC ED/CC EXPANSION 4034

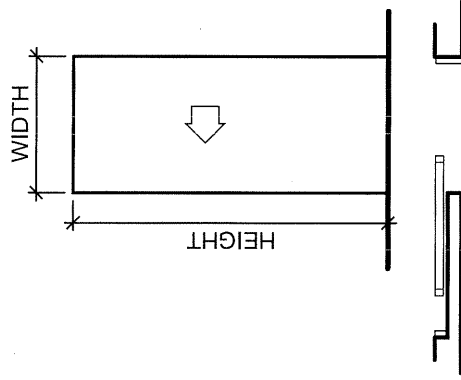
08 06 10 - PAGE 2 of 6

09/26/08



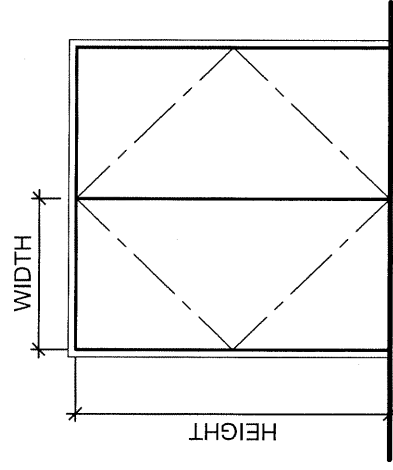
**K** OVERHEAD COILING DOOR  
**K1** COUNTER COILING DOOR

ICU/CCU 2-PANEL DOOR/FRAME  
 WITH BREAKOUT

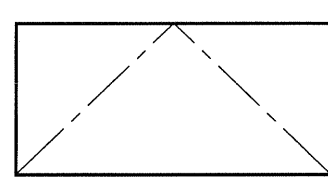


**L** FLUSH SLIDING

ICU/CCU 3-PANEL  
 DOOR/FRAME



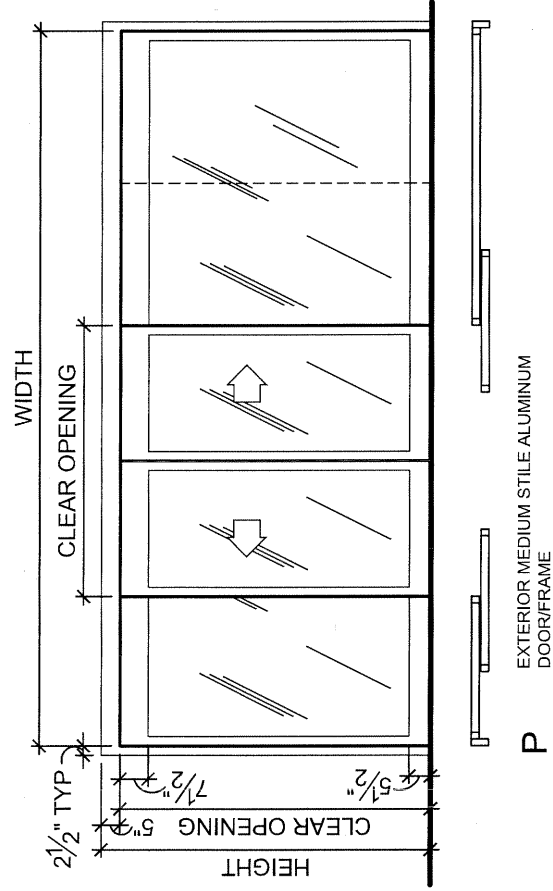
**M** SPECIAL DOOR/FRAME  
**M1** SPECIAL DOOR/FRAME - EGRESS



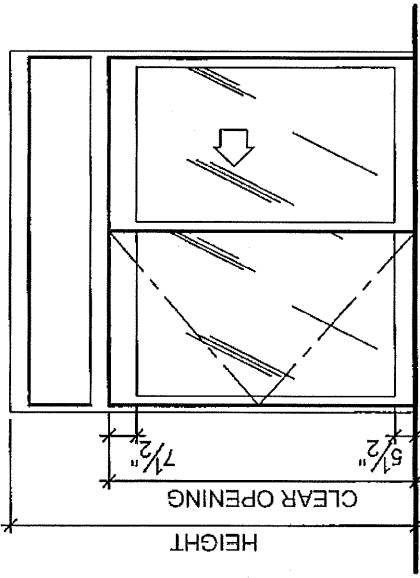
**N** SPECIAL DOOR, RADIATION  
 PROTECTION

DOOR TYPES

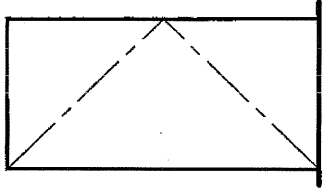
MMC ED/CC EXPANSION 4034



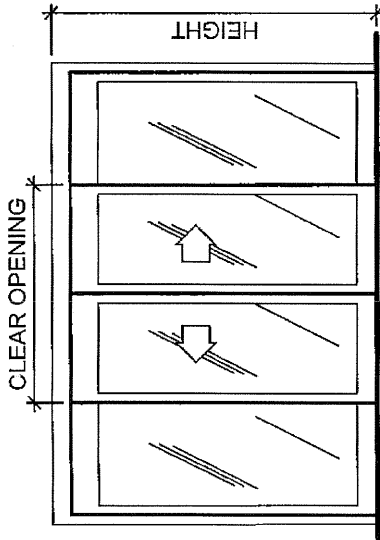
**P** EXTERIOR MEDIUM STILE ALUMINUM  
 DOOR/FRAME



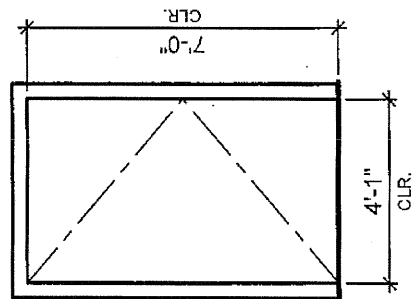
T ICU/CCU 2-PANEL DOOR/FRAME WITH BREAKOUT, TRANSOM



S MEDIUM STILE ALUMINUM DOOR/FRAME



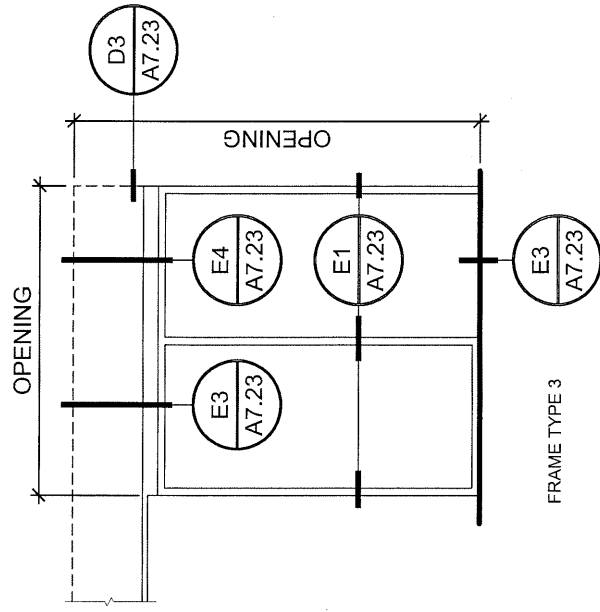
R EXTERIOR MEDIUM STILE ALUMINUM DOOR/FRAME



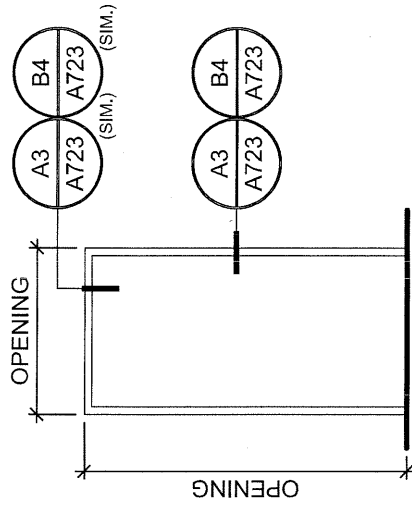
U SPECIAL DOOR/FRAME, RADIATION THERAPY VAULT, VERIFY REQ. W/DOOR MANUF.

# DOOR TYPES

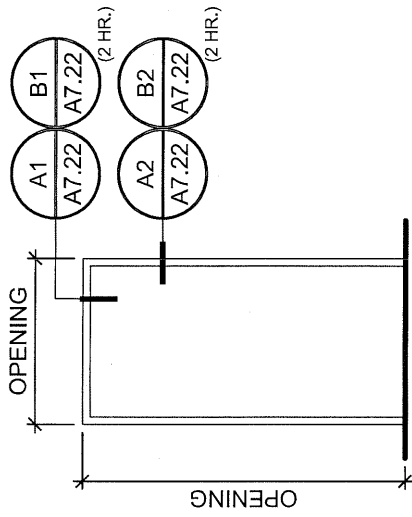
MMC ED/CC EXPANSION 4034



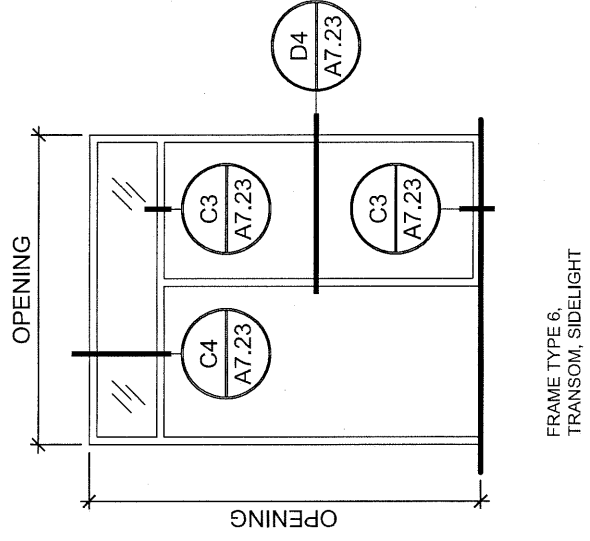
FRAME TYPE 3



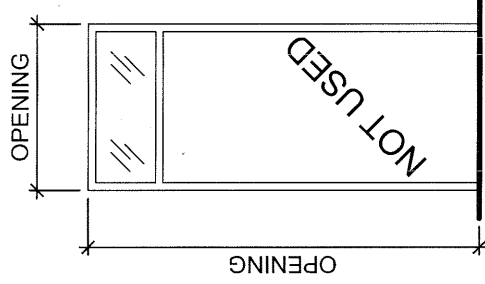
FRAME TYPE 2, PATIENT  
RESCUE



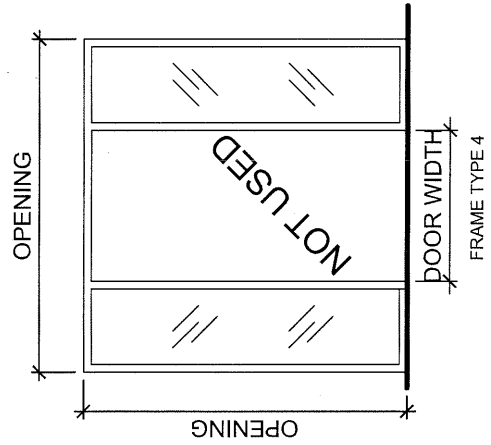
FRAME TYPE 1, HM.



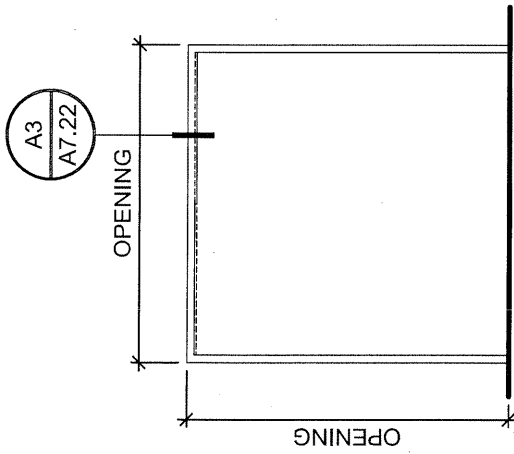
FRAME TYPE 6,  
TRANSOM, SIDELIGHT



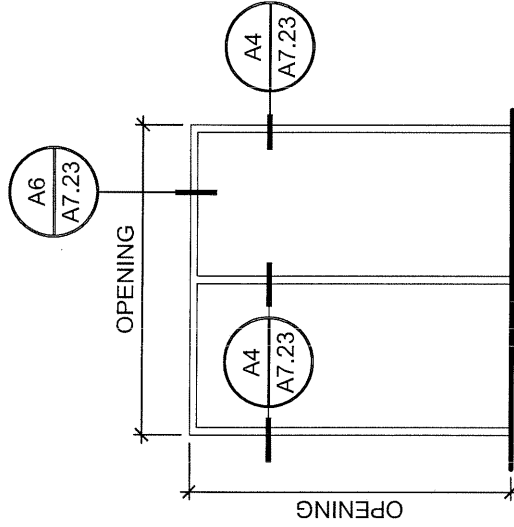
FRAME TYPE 5,  
TRANSOM



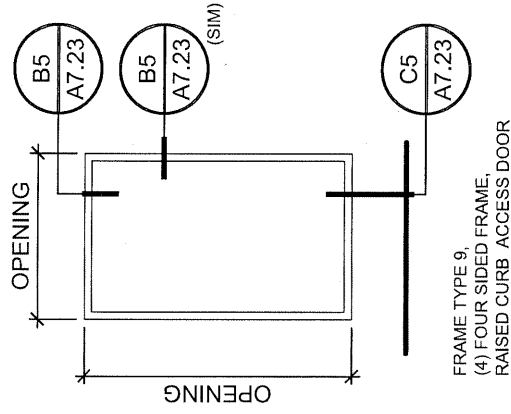
FRAME TYPE 4



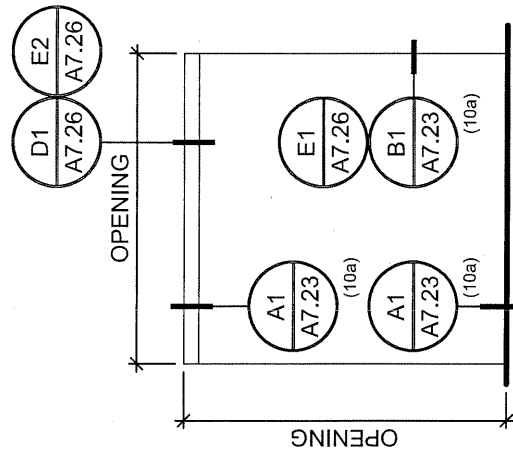
FRAME TYPE 7,  
DOUBLE EGRESS



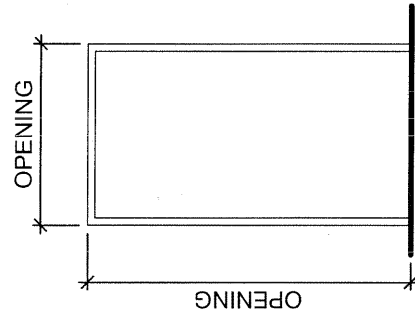
FRAME TYPE 8,  
SPLIT-FRAMED SLIDER



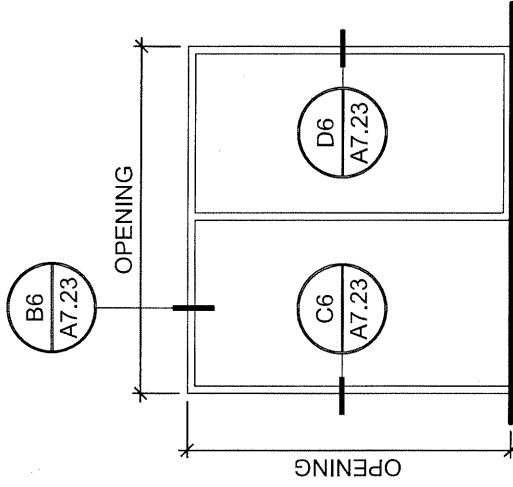
FRAME TYPE 9,  
(4) FOUR SIDED FRAME,  
RAISED CURB ACCESS DOOR



FRAME TYPE 10,  
GLASS TOP HUNG, TRACKLESS, W/ SIDE LIGHT  
FRAME TYPE 10a,  
GLASS W/ BOTTOM TRACK, W/ NO SIDE LIGHT



FRAME TYPE 11,  
LEAD LINED, STEEL FRAME



FRAME TYPE 12,  
FRAME W/ SIDE LIGHT

## SECTION 08 11 13 STEEL DOORS & FRAMES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Interior and exterior hollow metal doors including hollow metal fire doors.
- B. Welded steel frames for doors and relights.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of product data and Shop Drawings.
- C. Section 08 06 00 - DOOR SCHEDULE: Scheduled steel doors, frames and hardware, door frames scheduled to be grouted.
- D. Section 08 06 10 - DOOR TYPES.
- E. Section 08 71 00 - DOOR HARDWARE: Hardware to be installed.
- F. Section 08 80 00 - GLAZING: Method of glazing light frames.
- G. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: Grouting of frames.

#### 1.3 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI A250.8, Recommended Specifications for Standard Steel Doors and Frames.
- B. ASTM International (ASTM):
  - 1. ASTM A153 / A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. ASTM A653 / A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 3. ASTM A666, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
  - 4. ASTM A1008 / A1008M, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy with Improved Formability, Solution Hardened and Bake Hardenable.
  - 5. ASTM A1011 / A1011M, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
  - 6. ASTM C1363, Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.
- C. National Fire Protection Association (NFPA):
  - 1. NFPA 80, Standard for Fire Doors and Other Opening Protectives.
  - 2. NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. The Society for Protective Coatings (SSPC):
  - 1. SSPC Painting Manual, vol. 2, Systems and Specifications.
- E. Underwriters Laboratory (UL):
  - 1. UL 10C, Positive Pressure Fire Tests of Door Assemblies.

#### 1.4 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI A250.8 except as herein specified.
  - 1. Gauge of metal: Manufacturer's standard gauge per ANSI 250.8 for un-coated metal.
- B. Fire-Rated Door Assemblies: 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.
  - 1. Test pressure: Test at positive pressure per UL IOC for all "S" labeled doors.
  - 2. Oversize fire-rated door assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
  - 3. Temperature-rise rating: If indicated, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

## SECTION 08 11 13 STEEL DOORS & FRAMES

4. On doors scheduled with continuous hinges, locate labels on the top of doors and head of frames.
- C. Codes and Standards: Comply with provisions of following Codes, Specifications and Standards, except as otherwise indicated.
  1. ASTM A 153 / A 153M.
  2. ASTM A 653 / A 653M.
  3. ASTM A 666.
  4. ASTM A 1008 / A 1008M.
  5. ASTM A 1011 / A 1011M.
  6. ASTM C 1363.

### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.
- C. Shop Drawings: Submit Shop Drawings for fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
  1. Provide Schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
  2. Indicate coordination of glazing frames and stops with glass and glazing requirements.

### 1.6 DELIVERY, STORAGE & HANDLING

- A. Deliver steel doors cartoned or crated to provide protection during transit and job storage.
- B. Inspect steel doors and frames upon delivery for damage. Minor damage may be repaired provided refinished items are equal in all respects to new Work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames in building site under cover. Place units on minimum 4 inch high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create a humidity chamber. If cardboard wrapper on door frames becomes wet, remove carton immediately. Provide 1/4 inch spaces between stacked doors to promote air circulation.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Hot-Rolled Steel Sheets: ASTM A1011 / A1011M, CS (commercial steel), Type B; free of scale, pitting or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheets: ASTM A1008 / A1008M, CS (commercial steel), Type B.
- C. Galvanized Steel Sheets: ASTM A653 / A 653M, CS (commercial steel). Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating.
- D. Stainless Steel Sheets: ASTM A666, Austenitic, Type 304.
- E. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanized items to be built into exterior walls, complying with ASTM A153, Class C or D as applicable.
- F. Shop-Applied Paint:
  1. Primer: Rust-inhibitive enamel or paint, either for air-drying or baking, suitable as a base for specified finish paints. Provide lightest color available. Wipe coat galvanizing will be not acceptable.

### 2.2 FABRICATION, GENERAL

- A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify Work that cannot be permanently factory-assembled before shipment, to assure proper assembly at Project Site. Comply with ANSI A250.8 requirements as follows:



## SECTION 08 11 13 STEEL DOORS & FRAMES

1. Interior doors: Level 2, Model 2, with minimum 18 gauge faces. Provide seamless door edges.
2. Exterior and stairwell doors: Level 3, Model 2, seamless with minimum 16 gauge faces. Provide seamless door edges.
- B. Fabricate door frames and exposed faces of doors and panels, including stiles and rails of non-flush units, from only cold-rolled steel.
- C. Fabricate concealed stiffeners, reinforcement and edge channels from either cold-rolled or hot-rolled steel (at fabricator's option).
- D. Fabricate doors with laminated cores, not welded to faces.
- E. Fabricate exterior doors, panels, frames from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16 gauge steel closing channels. Seal all joints for weatherproof condition.
- F. Provide clearances for doors, unless otherwise shown, as follows: 1/8 inch at each jamb and head, 1/8 inch at meeting stiles of pairs of doors and 1/2 inch at bottom where no threshold or carpet is required. Where a threshold is indicated, provide 1/8 inch clearance above the threshold. Where carpet is indicated, provide 1/4 inch clearance above the carpet.
  1. Bevel doors 1/8 inch in 2 inches at lock and hinge edges.
- G. At exterior locations and elsewhere as shown or scheduled, provide doors which have been fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C1363. Unless otherwise indicated, provide thermal-rated assemblies with maximum U value of 0.20.
- H. Door Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Provide reinforcing, drilled and tapped for fasteners as follows:
  1. Hinges: 10 gauge plate typical, except 7 gauge plate on Doors 3'-8" and wider. Equivalent number of threads on lighter gauge plates not acceptable.
  2. Lock fronts: 12 gauge plate by size as required by approved lock manufacturer.
  3. Mortise locks: 14 gauge by size as required by approved lock manufacturer.
  4. Closers and automatic operators: 12 gauge, size as required by closer / operator manufacturer.
  5. Push / pulls: 14 gauge reinforcing as required.
  6. Electric hinges: Where electric hinges or power transfers are scheduled, provide junction boxes equal to Stanley JB-1 in door frames at the center hinge or power transfer location. Provide conduit from power transfer to lock cutout or exit device in all doors to receive electronic hardware.
  7. For concealed overhead door closers, provide space, cutouts, removable access plates, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.
  8. Mounting heights for hardware: Table 5 of ANSI 250.8, except locate exit devices so that the panic bar is below the 43 inch door light, and as otherwise indicated on Door Schedule.
- I. Terminate bottoms of frames at the indicated floor level. Where floor fill or setting bed is shown, support frames by adjustable clip angles. Provide 12 gauge angle floor clips welded to frames.
- J. Anchors for metal stud partitions shall be 16 gauge zee clips welded to frames at 2 feet on center. One leg of each zee shall be full width of frame, one leg shall be the exact width and at the exact location of the metal stud and the web of the zee shall be coped to allow the gypsum board to project inside the frame.
- K. Head Anchors: Provide two head anchors for frames more than 42 inches wide and mounted in steel-stud walls.
- L. Astragals: Where scheduled for double steel doors, furnish active leaf with factory applied steel astragal.
- M. Anchors for Masonry Construction: Adjustable, flat, corrugated or perforated T-shaped anchors to suit frame size; formed of same material as frame; not less than 0.053 inch thick; with leg not less than 2 inches wide by 10 inches long. Furnish at least three anchors per jamb for typical 7 foot high door frames.

## SECTION 08 11 13 STEEL DOORS & FRAMES

- N. Anchors for concrete and prior built masonry walls shall consist of 3/8 inch countersunk bolts and full width of frame spacers. Provide four anchors per jamb. Where concrete is not full height of jambs, provide a combination of zee and bolted anchors.
- O. Provide temporary spreaders for all three sided frames to prevent racking and distortion during shipment.
- P. Provide flush moldings for door lights. Form one side of the door with integral glass stops. Provide removable stops on the other side of the door, flush with door face.
  - 1. On "S" labeled doors, provide positive pressure tested door light trim.
- Q. Glazed Light Frames:
  - 1. Form glazed light frames to the profiles shown. Miter and weld light frames as specified for door frames. Provide anchors at jambs same as for door frames.
  - 2. Provide removable glass stops with oval-head countersunk Phillips screws spaced at 12 inches on center.
  - 3. Provide 45 minute labeled, glazed light frames where indicated.
- R. Shop Painting:
  - 1. Clean, treat and paint exposed surfaces of steel door and frame units, including galvanized surfaces.
  - 2. Galvanizing repair paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20.
  - 3. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint. Fill in seams as required. Chemically treat surfaces with phosphate compound to assure maximum paint adhesion.
  - 4. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint. Apply two coats of primer to inside of frames which will be in contact with masonry or concrete.

### 2.3 STEEL FRAMES

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights and other openings, of types and styles as shown on Drawings and Door Schedule. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16 gauge cold-rolled steel. Frames for openings over 3'-0" wide and all exterior doors shall be 14 gauge.
- B. Form stainless steel frames from 0.0625 inch thick stainless steel sheets with No. 4 finish.
- C. Fabricate frames with mitered corners, continuously welded on back side of faces.
- D. Plaster Guards: Provide 26 gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- E. Door Silencers: Except where gaskets are scheduled, drill stops to receive three silencers on strike jambs of single-swing frames and two silencers on heads of double-swing frames.

## PARTS 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Install steel doors, frames and accessories in accordance with final Shop Drawings, manufacturer's data and as herein specified.
- B. Except for frames located at in-place concrete or masonry installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned and braced securely until permanent anchors are set.
- C. Anchor frames to floors with two powder-actuated fasteners at each jamb. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
- D. At in-place concrete or masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices. Fill in countersunk bolt heads with fiberglass automotive body putty, sand smooth and leave ready for painting.
- E. Install fire-rated frames in accordance with NFPA 80.
- F. Door Installation: Fit steel doors accurately in frames, with specified clearances.

### 3.2 ADJUST & CLEAN

## SECTION 08 11 13 STEEL DOORS & FRAMES

- A. Surface Repair: Inspect doors and frames prior to finish painting. Fill all dents with fiberglass automotive body putty and sand smooth. Fill mis-fabricated hardware cutouts with matching thickness steel, welded and ground.
- B. Prime-Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

END OF SECTION



## SECTION 08 14 16 FLUSH WOOD DOORS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Interior flush wood doors.
- B. Factory finish: Doors scheduled to receive natural finish shall be factory finished.
- C. Factory glazing option: At Contractor's option, wood doors may be furnished factory glazed.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of product data, Shop Drawings and samples.
- C. Section 08 06 00 - DOOR SCHEDULE: Scheduled flush wood doors, door frames scheduled to be grouted.
- D. Section 08 06 10 - DOOR TYPES.
- E. Section 08 11 00 - STEEL DOORS & FRAMES: Steel frames to receive flush wood doors.
- F. Section 08 71 00 - DOOR HARDWARE: Hardware to be installed.
- G. Section 08 80 00 - GLAZING: Method of glazing light frames.
- H. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected patterns and colors.
- I. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: Grouting of frames.

#### 1.3 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI / WDMA I.S.1-A, Architectural Wood Flush Doors.
  - 2. ANSI / NEMA LD 3, High-Pressure decorative Laminates.
- B. ASTM International (ASTM):
  - 1. ASTM A152 / A152M, Standard Specification for
- C. Architectural Woodwork Institute (AWI):
  - 1. Architectural Woodwork Quality Standards, 8th Edition, Version 1.0.
- D. National Electrical Manufacturers Association (NEMA):
- E. National Fire Protection Association (NFPA):
  - 1. NFPA 80, Standard for Fire Doors and Other Opening Protectives.
  - 2. ANSI/NFPA 252, Standard Methods of Fire tests of Door Assemblies.
- F. Underwriters Laboratory (UL):
  - 1. UL 10C, Positive Pressure Fire Tests of Door Assemblies.

#### 1.4 QUALITY ASSURANCE

- A. Quality Standards: Provide wood flush doors complying with the following standards:
  - 1. ANSI / WDMA I.S.1-A. Designations for grade and door construction under types of door refers to this Standard.
  - 2. AWI Quality Standards: Architectural Woodwork Quality Standards:
    - a. Section 1300, Architectural Flush Doors.
    - b. Section 1500, Factory Finishing.
- B. Fire-Rated Wood Doors: Provide wood doors which are identical in materials and construction to units tested in door and frame assemblies per ANSI/NFPA 252 and which are labeled and listed for ratings indicated by UL, Warnock Hersey or other testing and inspection agency acceptable to authorities having jurisdiction.
- C. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist), or which show telegraphing of core construction in face veneers or do not conform to tolerance limitations of ANSI / WDMA I.S.1-A and AWI. The warranty shall guarantee all interior doors for life.
- D. Finish: Match stain on Architect's sample.

## SECTION 08 14 16 FLUSH WOOD DOORS

### 1.5 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Product Data: Submit door manufacturer's product data for each type of wood door, including details of core and edge construction, trim for openings and finishing specifications for doors to receive factory finish.
- C. Shop Drawings: Submit Shop Drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire-ratings, requirements for factory finishing and other pertinent data.
- D. Samples: Submit samples for the following:
  - 1. Transparent finish doors: Submit one 8-1/2" x 11" sample of door corner with faces representing typical range of veneer, with exposed edges, blocking and other solid wood components as specified.
    - a. Furnish two 8-1/2 x 11 inches samples of veneer with factory finish. Resubmit samples if first submittal is rejected.
    - b. Factory glazing option: Furnish two 12 x 12 inches samples of specified glass.

### 1.6 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with recommendations of ANSI / WDMA I.S.1-A, Section G-20, as well as with manufacturer's instructions.
- B. Identify each door with individual opening numbers which correlate with designation system on approved Shop Drawings for door, frames and hardware, using temporary, removable or concealed markings.
- C. Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period.

## PART 2 - PRODUCTS

### 2.1 INTERIOR FLUSH WOOD DOORS

- A. Approved Manufacturers: Eggers Industries, Algoma Hardwoods, Marshfield, VT Industries.
- B. Solid Core Doors for Transparent Finish: Comply with the following requirements:
  - 1. Faces: As scheduled in Section 09 06 10, A grade face veneer, slip matched, domestic veneer, tapeless spliced, with grain running vertically, belt and polish sanded.
  - 2. Grade: Custom.
  - 3. Construction: PC-5 (particle board core, 5-ply).
    - a. Fully glazed doors: Timberstrand LSL core.
  - 4. Edge Construction: As scheduled in Section 09 06 10.
  - 5. Blocking: 5 inch minimum solid wood or Timberstrand LSL top rail.
- C. Solid Core Doors With Plastic Laminates Faces: Comply with the following requirements:
  - 1. Laminate faces: High pressure decorative laminates complying with ANSI / NEMA LD 3 and as follows.
  - 2. Color: As scheduled in Section 09 06 10.
  - 3. Faces: GP-50 (0.050 inch nominal thickness).
  - 4. Grade: Custom.
  - 5. Construction: PC-HPDL (particle board core).
  - 6. Stiles: Mill option hardwood.
  - 7. Door edges: Laminate edges applied prior to face sheets.
  - 8. Blocking: 5 inch minimum solid wood or Timberstrand LSL top rail.
- D. Solid Core Doors for Opaque Finish: Comply with the following requirements:
  - 1. Faces: Any closed-grain hardwood of mill option.
  - 2. Grade: Custom.
  - 3. Construction: PC-5 (particle board core, 5-ply) or PC-7 (particle board core, 7-ply).

## SECTION 08 14 16 FLUSH WOOD DOORS

4. Edges: Close grain hardwood of mill option.
5. Blocking: 5 inch minimum solid wood or Timberstrand LSL top rail.
- E. Fire-Rated Solid Core Doors: Comply with the following requirements:
  1. Faces: As specified above.
  2. Construction: Manufacturer's standard core construction as required to provide fire-resistance rating indicated.
  3. Edge Construction: Provide laminated composite edge construction and blocking for improved screw-holding capability where mineral core construction is required. Visible portion of edge construction shall match face construction.
  4. Positive pressure labeled doors:
    - a. If intumescent gasketing is required, provide concealed gaskets.
    - b. Provide door tops of intumescent material.
  5. Blocking: Provide laminate composite blocking for improved screw-holding capability as follows:
    - a. Lock blocking.
    - b. 5 inch top rail.
    - c. 5 inch mid-rail in doors scheduled for exit devices.

### 2.2 VISION LITES

- A. Trim for Light Openings in Non-Rated Doors: Hardwood glass stops, molding M3 per ANSI / WDMA I.S.1-A, unless otherwise indicated. Provide beads in matching hardwood for natural finish doors.
- B. Trim for Light Opening in Rated Doors: Metal molding M4 per ANSI / WDMA I.S.1-A
- C. Openings: Cut and trim openings through doors and panels as shown. Provide blocking at edges of openings unless fire-rating requires through bolted light frames. Comply with applicable requirements of referenced standards for kind(s) of doors required.

### 2.3 PREFITTING AND PREPARATION FOR HARDWARE

- A. Prefit and premachine wood doors at factory, as practicable.
- B. Comply with tolerance and requirements of ANSI / WDMA I.S.1-A for prefitting. Machine doors for hardware requiring cutting of doors, including edge guards if they are scheduled. Comply with final hardware schedules and door frame shop drawings and with hardware templates and other essential information required to ensure proper fit of doors and hardware.
  1. Machine door edges for edge guards where recessed edge guards are scheduled.
- C. Fitting Clearances: Provide clearances of 1/8 inch at jambs and heads; 1/16 inch per leaf at meeting stiles for pairs of doors; 1/4 inch from bottom of door to top of carpet; and 3/8 inch from bottom of door to other floor finish. Where threshold is shown or scheduled, provide 1/4 inch clearance from bottom of door to top of threshold.
  1. Bevel non-rated doors 1/8 inch in 2 inches at lock and hinge edges.
  2. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; bevel hinge stiles if permitted by labeling agency.
  3. Square hinge edges where noted to receive edge guards.
- D. Provisions for Electronic Hardware: Provide raceway or drilled hole for installing low voltage wiring on doors scheduled for electric locks or electronic panic devices.

### 2.4 FACTORY-FINISH

- A. Provide natural finish **[insert]** doors with factory-applied manufacturer's standard finish that complies with AWI Section 1500 and as follows:
  1. Finish system: Conversion varnish.
  2. Sheen: Satin.
- B. Finish tops and bottoms of doors with minimum of two coats of sealer.

## SECTION 08 14 16 FLUSH WOOD DOORS

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Require Installer to examine door frames, after their installation and doors prior to their hanging, for the following purposes:
  - 1. To verify that frames comply with indicated requirements for type, size, location and swing characteristics and have been installed with plumb jambs and level heads.
  - 2. To verify that doors are free of defects that could cause their rejection.
- B. Do not allow installer to proceed with installation until unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and referenced Standards, and as indicated.
- B. Prefit Doors: Fit to frames and machine for hardware to whatever extent not previously worked at factory as required for fit and uniform clearance at each edge.
- C. Shop-Finished Doors: Restore finish on edges of shop-finished doors before installation, if fitting or machining is required at the Project Site.

#### 3.3 ADJUSTING AND PROTECTION

- A. Re-hang or replace doors which do not swing or operate freely, as directed by Architect.
- B. Finished Doors: Refinish or replace doors damaged during installation, that are warped, twisted, show-through or not true in plane, and that do not comply with the warranty.
- C. Institute protective measures as recommended and accepted by door manufacturer to assure that wood doors will be without damage or deterioration at time of subsequent completion.

END OF SECTION



PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnish vinyl acrylic clad wood doors.
- B. Factory fitting flush vinyl acrylic clad wood doors to frames and factory machining for hardware.
- C. Non-rated doors.
- D. 20-minute, 60-minute, 90-minute, and 120-minute fire-rated doors as scheduled.

1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 SUBMITTAL PROCEDURES: Product data, Shop Drawings, Samples.
- C. Section 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY.
- D. Section 08 11 13 - STEEL DOORS & FRAMES
- E. Section 08 14 16 - FLUSH WOOD DOORS.
- F. Section 08 71 00 - DOOR HARDWARE: exit devices
- G. Section 08 80 00 - GLAZING: For glass view panels in doors

1.3 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI A208.1, Standard for Particleboard.
- B. National Fire Protection Association (NFPA):
  - 1. NFPA 80, Standard for Fire Doors and Other Opening Protectives.
  - 2. NFPA 101, Life Safety Code.
  - 3. NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- C. Underwriters Laboratory (UL):
  - 1. UL 10C, Positive Pressure Fire tests of Door Assemblies.
- D. Wood & Door Manufacturers Association (WDMA):
  - 1. ANSI / WDMA I.S. 1-A, Standard for Architectural Wood Flush Doors.
  - 2. WDMA TM-6, Test Methods for Determining the Performance of Adhesive Bonds in Doors Under Accelerated Aging Conditions.
  - 3. WDMA TM-7, Test Method to Determine the Physical Endurance of Wood Doors and Associated Hardware Connections Under Accelerated Operating Conditions.
  - 4. WDMA TM-8, Test Methods to Determine Hinge Loading Resistance of Wood Door Stiles.
  - 5. WDMA TM-10, Test Method to Determine the Screw Holding Capacity of Wood Door Stiles.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain vinyl acrylic clad wood doors through one source from a single manufacturer.
- B. Quality Standard: Comply with ANSI / WDMA I.S. 1-A.
  - 1. Door shall meet all performance attributes for the following performance duty level: Extra Heavy Duty.
  - 2. Tolerances for warp, telegraphing, squareness and prefitting dimensions as per the latest edition of ANSI / WDMA I.S. 1-A.
- C. Fire-Rated Wood Doors: Doors 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 Positive Pressure and NFPA 252.
- D. Where fire-rated doors are required, provide doors labeled by Intertek/Warnock Hersey. Construction details and hardware application shall be as approved by labeling agency.

1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: For each type of door, submit manufacturer's data sheets including details of core and edge construction.

## SECTION 08 14 23 VINYL ACRYLIC CLAD WOOD DOORS

- C. Shop Drawings: Submit complete schedule indicating location, size, hardware sets, swing of each door; elevation of each type of door and construction details not covered in product data and other pertinent data. Indicate dimensions and locations of mortises and holes for hardware.
    - 1. Indicate dimensions and locations of cutouts.
    - 2. Indicate fire-ratings for fire doors.
  - D. Samples for verification.
- 1.6 DELIVERY, STORAGE & HANDLING
- A. Comply with requirements of referenced Standard and manufacturer's written instructions.
  - B. Package doors individually in poly-bags and stack on pallet, not exceeding 15 doors per pallet.
  - C. Mark each door with opening number used on Shop Drawings.
  - D. Do not store doors in damp areas.
  - E. Do not subject doors to extreme conditions or changes in heat, dryness or humidity in accordance with the latest edition of ANSI / WDMA I.S. 1-A.
  - F. Doors should be lifted and carried when being moved, not dragged across one another.
- 1.7 PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver doors or install doors until building is enclosed, wet Work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- 1.8 WARRANTY
- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship. Conditions are subject to the terms set forth in the manufacturer's warranty.
    - 1. Solid-Core Interior Doors: provide manufacturers 5-year limited written warranty guarantee against warpage, delamination and defects in materials and workmanship.

## PART 2 - PRODUCTS

- 2.1 MANUFACTURER
- A. Subject to compliance with all requirements, provide one of the following:
    - 1. Construction Specialties, Inc. Acrovyn Door System, [www.c-sgroup.com/acrovyn-doors](http://www.c-sgroup.com/acrovyn-doors).
- 2.2 DOOR CONSTRUCTION - GENERAL
- A. Manufacturer's standard flush solid core wood door construction to meet required fire ratings.
  - B. Thickness: 1-3/4 inches.
  - C. Stile edge of doors shall have a 1/8-inch in 2-inches bevel on both strike and hinge edges.
  - D. Fixed stile edge guards of door shall be non-face-fastened edge protection, flush with face of door.
  - E. Top and bottom rails shall be factory sealed with approved wood sealer.
  - F. Doors shall be prefit and beveled at factory to fit openings. Prefit tolerances shall meet requirements of ANSI / WDMA I.S. 1-A.
  - G. Door Edges: Door edge shall be replaceable, exclusive of fasteners, flush with face of door and include 1/4-inch radius edges. Edges to be provided as part of construction of the door from manufacturer.
    - 1. Type: Stainless steel, 20 gauge, Type 304 with No. 4 finish, full height of door panel, strike and hinge side.
  - G. Factory machine doors for mortised hardware items.
  - H. Glass and glazing frames provided and installed under Section 08 80 00.
  - I. Face Veneer Laminate: Chameleon No. 372 Classic Maple.

2.3 FABRICATION

- A. Factory-fit doors to suit frame opening sizes indicated, with the following uniform clearances unless otherwise indicated:
  - 1. For fire-rated doors comply with clearance requirements of referenced quality Standard for fitting in accordance with requirements listed in NFPA 80.
- B. Factory machine doors for hardware that is not surface applied. Comply with final Hardware Schedules, door frame Shop Drawings, and hardware templates.
  - 1. Coordinate measurements of hardware mortises in metal frames. Verify dimensions and alignment before fabrication.
- C. Lite openings must be cut by a certified manufacturer or machining distributor.
  - 1. Glazing and frames must be installed by a certified manufacturer or machining distributor.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
  - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  - 2. Adjust frames to plumb condition before door installation.
  - 3. Tolerances for warp, squareness and pre-fitting dimensions shall meet requirements of ANSI / WDMA I.S. 1-A.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation see Section 08 71 00 - Door Hardware.
- B. Install doors in accordance with manufacturer's written instructions, referenced quality Standard and as indicated.
  - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Factory fitted doors: Align in frames for uniform clearance at each edge.

3.3 ADJUSTING

- A. Operating: Re-hang or replace doors that do not swing or operate freely.

3.4 PATCHING & REPAIR

- A. Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing when acceptable to Architect. Otherwise, remove and replace damaged units when patching repairs are unacceptable to Architect.

END OF SECTION



## SECTION 08 31 13 ACCESS DOORS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide access doors in accordance with the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of product data.
- C. Divisions 22 and 23: Plenum access doors.
- D. Division 23: Access doors not shown on Architectural Drawings.

#### 1.3 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinges and latch from manufacturer listed in Underwriters Laboratories, Inc.; "Building Materials Directory" for rating shown.
  - 1. Provide UL label on each fire-rated access door.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Karp Associates, Inc. is the basis of design. Subject to compliance with requirements, provide access doors by one of the following:
  - 1. Bar-Co., Inc.
  - 2. J.L. Industries
  - 3. Milcor Division; Inryco, Inc.
  - 4. Nystrom, Inc.
  - 5. Cesco Products

#### 2.2 MATERIALS AND FABRICATION

- A. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
- B. Ceiling Access Doors for Drywall Ceilings: Model KSTDW/CAD, sizes as shown on Drawings.
  - 1. Frame: 20 gauge galvanized steel.
  - 2. Door: 20 gauge galvanized steel and shall be lined with 3/8 inch mineral fiberboard.
  - 3. Trim: Galvanized steel drywall bead.
  - 4. Gasketing: Flame retardant polyurethane.
  - 5. Locks: Square head key wrench operated.
  - 6. Hinge: Concealed pivot with a controlled action device (CAD). Door panel shall open to check position for safety then release for a 90 degree opening.
- C. Fire Rated Access Door for Walls: Model KRP-150FR, B-1 1/2 label, size as shown on Drawings.
  - 1. Frame: 16 gauge steel.
  - 2. Door: 20 gauge steel, welded pan type.
  - 3. Flange of door: 1 inch wide, 16 gauge steel.
  - 4. Hinge: Continuous
  - 5. Door: Filled with 2 inch thick fire rated insulation. Door shall have automatic closer, be self-latching and contain interior latch release.
  - 6. Latches: Bolt type, operated by a ring turn.
  - 7. Finish: Prime coat of rust inhibitive electrostatic powder, baked grey enamel.

## SECTION 08 31 13 ACCESS DOORS

- D. Universal Access Doors for Drywall Walls (Unrated): Model KDW, sizes as required.
  - 1. Frame: 16 gauge steel.
  - 2. Door: 14 gauge steel.
  - 3. Flange: Drywall bead.
  - 4. Hinge: Concealed, continuous piano type.
  - 5. Latch: Flush, screw driver operated cam.
  - 6. Finish: Prime coat of rust inhibitive electrostatic powder baked grey enamel.
- E. Access Doors in Ceramic Tile Walls: Model DSC-214M, sizes as required.
  - 1. Frame: 16 gauge stainless steel.
  - 2. Door: 14 gauge stainless steel.
  - 3. Hinge: Concealed continuous piano type.
  - 4. Latch: Screw driver operated cam.
  - 5. Finish: No. 4.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Comply with manufacturer's instructions for installation of access doors.
- B. Coordinate installation with Work of other trades.
- C. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.

#### 3.2 ADJUST & CLEAN

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

END OF SECTION

## SECTION 08 33 13 COILING COUNTER DOORS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Motor-operated non-rated smoke coiling counter door at Room 2049C, Discharge.
- B. Motor-operated non-rated smoke coiling counter door at Room 2063C, Discharge.
- C. Motor-operated non-rated smoke coiling counter door at Room 2101C, Pharmacy.
- D. Motor-operated non-rated smoke coiling counter door at Room 2279B, Security.
- E. Motor-operated fire-rated coiling counter door at Room 3022B, Pharmacy.
- F. Motor-operated non-rated smoke coiling counter door at Room 4041C, Pharmacy Work.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of Shop Drawings and Product Data.
- C. Section 05 50 00 - METAL FABRICATIONS: miscellaneous anchors and supports.
- D. Division 09: Preparation of framed openings.
- E. Division 26 - ELECTRICAL: for electrical requirements.

#### 1.3 QUALITY ASSURANCE

- A. Design: maximum of 25 cycles per day, overall maximum of 50,000 operating cycles for life of door.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit copies of manufacturer's Specifications, installation instructions and standard Details. Include only specific details that will be used on Project or highlight details in manufacturer's catalog.
- C. Shop Drawings: Indicate location, construction and installation details including motor and control locations, counterbalances, guides, anchors, and required clearances.

#### 1.5 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Protect against damage and discoloration.

#### 1.6 PROJECT CONDITIONS

- A. Verify prior to fabricating doors.
- B. If field measurements differ slightly from Drawing dimensions, modify Work as required for accurate fit. If measurements differ substantially, notify Architect prior to fabrication.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Approved Manufacturers: Subject to requirements, provide coiling counter doors from one of the following:
  - 1. Cookson Company, [www.cooksondoors.com](http://www.cooksondoors.com).
  - 2. Cornell Iron Works, [www.cornelliron.com](http://www.cornelliron.com).
  - 3. North American Rolling Door, Inc.
  - 4. Overhead Door Corp., [www.overheaddoor.com](http://www.overheaddoor.com).
  - 5. Pacific Rolling Door Co.
  - 6. Raynor, [www.raynor.com](http://www.raynor.com).
  - 7. Approved Substitution.

#### 2.2 FIRE-RATED OVERHEAD COILING DOOR

- A. Basis of Design: Cookson Type SDO-A10-1M, motor-operated fire-rated smoke control door.
- B. Door Curtain: Galvanized steel, 20 gauge minimum.
- C. Finish: Factory-applied thermoset powder coating. Color as selected from manufacturer's custom range.
- D. Guides, Brackets, Barrel, and Hood: manufacturer's standard.

## SECTION 08 33 13 COILING COUNTER DOORS

- E. Mounting: Surface mount to face of wall. Hood and motor to be mounted above finished ceiling.
- G. Fire-Rating: 3/4 Hour.
- H. Activation: Fire alarm system.
- I. Size: Exposed finished openings as scheduled in Section 08 06 00.

### 2.3 SECURITY OVERHEAD COILING DOOR

- A. Basis of Design: Cookson Type FCM, motor-operated smoke-control service doors.
- B. Door Curtain: Galvanized steel, 20 gauge minimum.
- C. Finish: Factory-applied thermoset powder coating. Color as selected from manufacturer's custom range.
- D. Guides, Brackets, Barrel, and Hood: manufacturer's standard.
- E. Mounting: Surface mount to concealed structure. Hood and motor to be mounted above finished ceiling.
- F. Size: Exposed finished openings as scheduled in Section 08 06 00.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Verify that openings to receive doors are true, square, plumb, accurately sized and located with level headers and sills, and otherwise properly prepared.
- B. Do not start Work until conditions are satisfactory.

### 3.2 INSTALLATION

- A. Follow door manufacturer's instructions and approved Shop Drawings.
- B. Install guide rails and tracks true within 1/4-inch per 10 feet, non-accumulating.
- C. Secure against displacement.
- D. Install doors free of warp, twist, and distortion.
- E. Make electric utility connections.
- F. Protect contacting dissimilar metals against galvanic corrosion.

### 3.3 ADJUSTMENTS

- A. Adjust moving parts to operate satisfactorily at time of Substantial Completion and during Warranty Period.

### 3.3 CLEANING & REPAIRING

- A. Clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by Work of this Section, including Work of other trades.
- B. Remove debris from Project Site upon completion of Work, or sooner if directed.

END OF SECTION



## SECTION 08 33 23 OVERHEAD COILING DOORS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Motor-operated fire-rated overhead coiling door at Room 3021, Pharmacy Pick-Up.
- B. Motor-operated security overhead coiling door at Room 2145, Secure Exam.
- C. Motor-operated security overhead coiling door at Room 2148, Secure Exam.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of Shop Drawings and Product Data.
- C. Section 05 50 00 - METAL FABRICATIONS: miscellaneous anchors and supports.
- D. Division 09: Preparation of framed opening.
- E. Division 26 - ELECTRICAL: for electrical requirements.

#### 1.3 QUALITY ASSURANCE

- A. Design: maximum of 25 cycles per day, overall maximum of 50,000 operating cycles for life of door.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit copies of manufacturer's Specifications, installation instructions and standard Details. Include only specific details that will be used on Project or highlight details in manufacturer's catalog.
- C. Shop Drawings: Indicate location, construction and installation details including motor and control locations, counterbalances, guides, anchors, and required clearances.

#### 1.5 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Protect against damage and discoloration.

#### 1.6 PROJECT CONDITIONS

- A. Verify prior to fabricating doors.
- B. If field measurements differ slightly from Drawing dimensions, modify Work as required for accurate fit. If measurements differ substantially, notify Architect prior to fabrication.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Approved Manufacturers: Cookson, Cornell, North American, Overhead, Pacific, Raynor, or approved.

#### 2.2 FIRE-RATED OVERHEAD COILING DOOR

- A. Basis of Design: Cookson Type FDO-B, motor-operated service doors.
- B. Door Curtain: Galvanized steel, 20 gauge minimum.
- C. Finish: Factory-applied thermoset powder coating. Color as selected from manufacturer's custom range.
- D. Guides, Brackets, Barrel, and Hood: manufacturer's standard.
- E. Mounting: Surface mount to face of wall. Hood and motor to be mounted above finished ceiling.
- G. Fire-Rating: 3/4 Hour.
- H. Activation: Fire alarm system.
- I. Size: Exposed finished opening approximately 25 feet wide x 8 feet high.

#### 2.3 SECURITY OVERHEAD COILING DOOR

- A. Basis of Design: Cookson Type FCM, motor-operated service doors.
- B. Door Curtain: Galvanized steel, 20 gauge minimum.

## SECTION 08 33 23 OVERHEAD COILING DOORS

- C. Finish: Factory-applied thermoset powder coating. Color as selected from manufacturer's custom range.
- D. Guides, Brackets, Barrel, and Hood: manufacturer's standard.
- E. Mounting: Surface-mount to concealed structure. Hood and motor to be mounted above finished ceiling.
- F. Size: Exposed finished opening approximately 13 feet wide x 9 feet high.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Verify that openings to receive doors are true, square, plumb, accurately sized and located with level headers and sills, and otherwise properly prepared.
- B. Do not start Work until conditions are satisfactory.

#### 3.2 INSTALLATION

- A. Follow door manufacturer's instructions and approved Shop Drawings.
- B. Install guide rails and tracks true within 1/4-inch per 10 feet, non-accumulating.
- C. Secure against displacement.
- D. Install doors free of warp, twist, and distortion.
- E. Make electric utility connections.
- F. Protect contacting dissimilar metals against galvanic corrosion.

#### 3.3 ADJUSTMENTS

- A. Adjust moving parts to operate satisfactorily at time of Substantial Completion and during Warranty Period.

#### 3.3 CLEANING & REPAIRING

- A. Clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by Work of this Section, including Work of other trades.
- B. Remove debris from Project Site upon completion of Work, or sooner if directed.

END OF SECTION

## SECTION 08 34 49 LINEAR ACCELERATOR ROOM DOOR (PRIVATE)

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide linear accelerator room door in accordance with Contract Documents. Drawings and general provisions of Contract, including General Conditions and Divisions-1 specification sections, apply to work of this section.
- B. Where Required: Door 3128A.
- C. Related Work Specified Elsewhere:
  - 1. Conduit and backboxes for automatic operator, controls, and limit switch: Division 16.

#### 1.2 QUALITY ASSURANCE

- A. Acceptable Manufacturers: Door shall be manufactured by and all accessories and part supplied by NELCO (New England Lead Burning Company), 1-415-357-9940, FAX 1-415-357-7909, or an approved equal.
- B. Design:
  - 1. Design door and frame to withstand all loads without deflection that might inhibit operation or impair radiation protection.
  - 2. Design radiation shielding to provide equivalent thickness in any straight line with no straight line gaps and minimum over lap of 1 inch. Exceptions: Maximum of ¼ inch gap under bottom of door.
- C. Warranty: Provide one year warranty against defect in materials and workmanship on automatic operator and controls commencing from date of substantial completion.

#### 1.3 SUBMITTALS:

- A. Submit under the provisions of Section 08 34 49.
- B. Shop Drawings: Provide shop drawings and product data of door, frame, and operator including details of required electrical work.

#### 1.4 PRODUCT HANDLING:

- A. Deliver sub-frames and anchorage devices in time to allow setting in forms.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS:

- A. Steel Sheet and Bars: Commercial quality carbon steel.
- B. Inserts, Bolts and Fasteners: Manufacturer's standard units.
- C. Primer: Rust inhibitive paint suitable as base for specified finish paints.
- D. Lead Sheet: Federal Specification QQL-201-F, Grade C, free from imperfections affecting performance. Thickness as indicated.
- E. Polyethylene: 5 percent boron content. Manufactured specifically for radiation protection.

#### 2.2 DOOR AND FRAME:

- A. Door: Steel bar and plate frame with ¼ inch minimum thick steel sheet faces. Reinforced internally with 3/4" lead and 4" polyethylene thickness lining.
- B. Frame: Minimum 1/4" thick steel sheet with weld-in anchors. Reinforce for hardware. Provide lead lines spreader/threshold at bottom of door frame.
- C. Hardware:
  - 1. Hinges: Heavy duty weld-on type, adjustable ball bearing hinges. Maximum carrying weight per hinge, 3400 lbs.
  - 2. Pulls: One each side.
- D. Fabrication: Weld joints continuously, dress exposed joints smooth and flush. Prepare for finish hardware that is not shop installed. Clean off all mill scale and foreign materials and shop prime.

#### 2.3 AUTOMATIC OPERATOR:

## SECTION 08 34 49 LINEAR ACCELERATOR ROOM DOOR (PRIVATE)

- A. Type: Saino 1960 electric operator.
- B. Capacity: Provide operator of the size recommended by manufacturer for the door size, weight, movement, and condition of exposure.
- C. Exposed Housing for Swinging Door Operators: Extruded or formed aluminum 0.062 inch minimum thickness, with provisions for maintenance access, with fasteners concealed when door is in closed position, formed to the profile shown.
- D. Adjustment Features: Provide operator with fully adjustable opening speeds, closing speeds and checking speeds.
- E. Push Plate Controls: Manufacturer's standard round or square stainless steel or aluminum push plate with the words "Push to Open" engraved in the face which will mount on a standard 4 ½ inches x 4 ½ inches electrical box.
- F. Operation: By push plate from either side. Door operations will be by trained staff in areas that are off limits to unauthorized persons. Upon power failure or power cutoff in the circuit, the door will then be usable by manual operation.

### PART 3 – EXECUTION

#### 3.1 INSTALLATION:

- A. Door frame and threshold shall be cast in place by the General Contractor. Plumb and align frame and secure it in forms.
- B. The manufacturer shall install the door and operator.
- C. General Contractor shall be responsible for retouching up damaged primer.
- D. Upon completion, door shall fit in frame with uniform ¼ inch clearances, be plumb, and operate smoothly.

END OF SECTION

## SECTION 08 41 26 ALL-GLASS ENTRANCES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Sliding all-glass entrance doors with sidelights.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of product data.
- C. Divisions 22 and 23: Plenum access doors.
- D. Division 23: Access doors not shown on Architectural Drawings.

#### 1.3 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinges and latch from manufacturer listed in Underwriters Laboratories, Inc.; "Building Materials Directory" for rating shown.
  - 1. Provide UL label on each fire-rated access door.
- B. Installer Qualifications: Minimum 3 years installing entrance assemblies similar to that specified in this Section.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.
- C. Shop Drawings: Dimensioned Drawings as follows:
  - 1. Plans: Indicate layout of all-glass entrance assemblies.
  - 2. Elevations:
    - a. Appearance of all-glass entrance layouts.
    - b. Locations and identification of manufacturer-supplied door hardware and fittings.
    - c. Locations and sizes of cut-outs and drilled holes for other door hardware.
  - 3. Details:
    - a. Interface with adjacent construction; include requirements for support and bracing at openings.
    - b. Installation details.
    - c. Appearance of manufacturer-supplied door hardware and fittings.
- D. Closeout Submittals: Operation and maintenance data for manufacturer-supplied operating hardware.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide access doors by one of the following:
  - 1.

#### 2.2 MATERIALS & FABRICATION

- A.

#### 2.3 ALL GLASS SLIDING DOOR & SIDELIGHT COMPONENTS

- A. Configuration:
  - 1. Single Panel Side Sliding with Side Panel.
- B. Door Panels: Maximum weight 240 pounds.
- C. Thickness: 1/2 inch.

#### 2.4 BALANCED ALL-GLASS ENTRANCES

- A. Doors:

## SECTION 08 41 26 ALL-GLASS ENTRANCES

1. Glazing: Float glass meeting requirements of ASTM C1036, Type 1, Quality q3, fully tempered in accordance with ASTM C1048, Kind FT, and as follows:
  - a. Thickness: 3/8 inch.
  - b. Thickness: 1/2 inch.
  - c. Thickness: 3/4 inch.
  - d. Color: Clear, Class 1.
  - e. Color: Bronze tint, Class 2, Style B.
  - f. Color: Grey tint, Class 2, Style B.
  - g. Prepare glazing panels for indicated fittings and hardware before tempering; alteration of glazing panels after tempering is not permitted.
  - h. Polish edges that will be sight-exposed in finished Work to bright flat polish.
  - i. Temper glass materials horizontally; visible tong marks or tong mark distortions are not permitted.
2. Fittings:
  - a. Rails: Continuous rail at top and bottom of door.
    - 1) Cross-section: 1-3/4 inches wide by 4 inches high.
    - 2) Profile: **[insert]** tapered.
    - 3) Profile: Tapered flat.
    - 4) Profile: Curved.
    - 5) Profile: Square.
  - b. Sight-exposed metal:
    - 1) Material: Extruded aluminum.
    - 2) Material: Stainless steel cladding; **[insert]** inch thickness.
    - 3) Material: Brass cladding; **[insert]** inch thickness.
    - 4) Finish: Clear anodized.
    - 5) Finish: Bronze anodized.
    - 6) Finish: Black anodized.
    - 7) Finish: Clear anodized.
    - 8) Finish: Number 4, satin polish.

### 2.5 SLIDING ALL-GLASS ENTRANCES

- A. Glazing: Float glass meeting requirements of ASTM C1036, Type 1, Quality q3, fully tempered in accordance with ASTM C1048, Kind FT, and as follows:
  1. Thickness: 3/8 inch.
  2. Thickness: 1/2 inch.
  3. Thickness: 3/4 inch.
  4. Color: Clear, Class 1.
  5. Color: Bronze tint, Class 2, Style B.
  6. Color: Grey tint, Class 2, Style B.
  7. Prepare glazing panels for indicated fittings and hardware before tempering; alteration of glazing panels after tempering is not permitted.
  8. Polish edges that will be sight-exposed.
  9. Temper glass materials horizontally; visible tong marks or tong mark distortions are not permitted.
- B. Rails: Continuous rail at top and bottom of door.

### 2.7 FABRICATION

- A. Fabricate all-glass entrance components in sizes, profiles, and configurations indicated on approved Shop Drawings.
- B. Fabricate doors and sidelights to allow for minimum clearances and shim spacing around perimeter of assembly.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that prepared openings are in accordance with Shop Drawings.
- B. Verify wall openings are ready to receive Work of this Section.

## SECTION 08 41 26 ALL-GLASS ENTRANCES

- C. Verify concealed overhead structural supports are sized and located properly.
- D. Supporting structure must be level to 1/8 inch over 10 feet or 1/4 inch over entire opening.
- E. Insure finished floor under operable glass partition is level plus or minus 1/8 inch in 10 feet, non-cumulative.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under project conditions.
- C. Preparation of opening shall conform to criteria set forth per ASTM E557, Standard Practice for Architectural Application and Installation of Operable Partitions".

### 3.2 INSTALLATION

- A. Installation of cold-formed metal framing for openings is specified in Section **05 40 00**.
- B. Installation of metal framing for openings is specified in Section 09 21 16.
- C. Install components of all-glass assemblies in accordance with Shop Drawings.
- D. Site Tolerances:
  - 1. Variation from level, horizontal components and sight lines: 1/8 inch in 10 feet, non-cumulative.
  - 2. Variation from plumb, vertical components and sight lines: 1/8 inch in 10 feet, non-cumulative.
  - 3. Variation from plane, installed assembly: Maximum 1/16 inch.
- E. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.
- F. Use anchorage devices to securely attach assembly to structure.
- G. Align assembly plumb and to indicated position, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- H. Install hardware and hang doors.
- I. Glaze sidelight glass joints in accordance with Section 08 80 00.

### 3.3 ADJUST & CLEAN

- A. Immediately prior to Substantial Completion, remove strippable protective materials from metal surfaces; clean metal surfaces free of adhesive residue and other foreign substances, using cleaning materials and methods recommended by fabricator of this Section.
- B. Adjust to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts.

### 3.4 PROTECTION

- A. Protect finished installation from damage by subsequent construction activities until Substantial Completion.
- B. Repair components damaged by subsequent construction activities in accordance with manufacturer's recommendations; replace damaged components that cannot be repaired to Architect's acceptance.

END OF SECTION





## SECTION 08 41 43 ALUMINUM-FRAMED ENTRANCES & STOREFRONTS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide aluminum window walls and entrances in accordance with the Contract Documents.
- B. Aluminum window walls and entrances, in conjunction with metal wall panels and glazing, shall provide a weather-tight exterior wall system.
- C. This Section includes the components of aluminum window wall.
- D. System performance requirements are specified in Section 08 05 00.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 33 12 - COORDINATED SUBMITTAL REQUIREMENTS: Submittals of this Section are affected by coordinated simultaneous submittal requirements.
- D. Section 07 42 43 - METAL WALL PANELS.
- E. Section 07 92 00 - JOINT SEALANTS.
- F. Section 08 44 12 - ALUMINUM CURTAIN WALLS - DESIGN & PERFORMANCE.
- G. Section 08 71 00 - HARDWARE: for Lock Cylinders, Power Supplies for Badge Readers and Electric Exit Devices.
- H. Section 08 80 00 - GLAZING: for glazing and structural silicone sealant.
- I. Section 08 71 13 - AUTOMATIC DOOR OPERATORS:
- J. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Break-formed steel window anchors

#### 1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA 2604, Voluntary Specification, Performance Requirements and Test Procedures High Performance Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International (ASTM):
  - 1. ASTM A123, Standard Specification for Zinc (Hot-Dip Galvanized) on Iron and Steel Products.
  - 2. ASTM A164, Standard Specification for Aluminum, Stainless Steel, or Plated Steel Fasteners.

#### 1.4 QUALITY ASSURANCE

- A. Installer: See Section 08 44 12 for requirements for single source responsibility.
- B. Substitutions: See Section 08 44 12.
- C. Warranties:
  - 1. Watertightness: See Section 08 44 12.
  - 2. Fluoropolymer coating finish: Provide manufacturer's 5-year warranty covering color fading, chalking and film integrity.
- D. Design Criteria: The Drawings are based on specific type and model of aluminum window wall by a single manufacturer. Equivalent type of products by other manufacturers may be accepted provided that deviations in dimensions and profiles are minor and do not materially detract from the design concept or intended performance as judged solely by the Architect.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Coordinated Submittals: See special requirements for coordinated simultaneous Submittals as specified in Section 01 33 12.
- C. Submit Shop Drawings showing all details of window wall, doors and frames, anchorage, sealing and test data to show compliance with specified performance criteria. Show interface details of related Work specified elsewhere.
  - 1. Provide structural calculations for window wall mullions and anchorages showing compliance with performance requirements.

## SECTION 08 41 43 ALUMINUM-FRAMED ENTRANCES & STOREFRONTS

- D. Samples for Finish Coordination: Submit duplicate samples of actual coating on aluminum to verify compliance.
  - E. Samples for Adhesion and Compatibility Testing: As specified in Section 08 44 12.
- 1.6 MOCK-UP
- A. Provide materials for mock-up and testing as specified in Section 08 44 12.
- 1.7 PROJECT CONDITIONS
- A. Field Measurements: Where possible, check actual wall openings in construction Work by accurate field measurement before fabrication; show recorded measurements on final Shop Drawings.
  - B. Coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of Work.
    - 1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit of window units.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE PRODUCTS

- A. Manufacturers: U.S. Aluminum is Basis of Design. Subject to meeting Project design requirements, Kawneer is approved equal.
- B. Typical Window Wall: Series "BT-525" and "BT-600." The framing systems shall provide a flush glass appearance to the outside with no vertical exterior stops. Top and bottom glass edge shall be retained by the head and sill members. Perimeter framing members shall have a face dimension of 2 inches. Overall depth shall be 5-1/4 inches for 1-inch system and 6 inches for 1-inch system. Intermediate mullions shall be designed for structural silicone glazing. All perimeter framing members shall incorporate a thermal barrier which eliminates all direct contact between interior and exterior aluminum sections.
  - 1. Window wall shall be reglazable from inside or outside.
  - 2. Window stool extenders: Color matched, widths as shown.
- C. Curtain Wall System (CW1): Series 3150 CW, thermally improved structural silicone glazing system, outside glazing, with injection molded end dams, a combination of structural silicone glazed mullions and "pressure cap" type horizontal members.
  - 1. Provide color-matched sill extenders where shown.
  - 2. Provide steel mullion reinforcing as shown and as required.
- D. Entrance Doors: Series 400 medium stile doors with square edged glazing stops:
  - 1. Standard top and bottom rails, offset hung stiles. Stops of door frames with weatherstripping.
  - 2. DM 920 bottom weatherstripping.
  - 3. WS195 bottom rails on center-hung doors **[Insert Door Numbers]**. Top rails shall have 1 inch webs.
- E. SUN CONTROL SYSTEM: Air foil louver with 36-inch outrigger arms and aluminum end caps by US Aluminum. Finish to match aluminum widow system.

### 2.2 MATERIALS

- A. Extrusions: 6063-T5 or T6 alloy and temper.
- B. Fasteners, where exposed, shall be aluminum or stainless steel in accordance with ASTM A164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from the aluminum. Anchors inside sill channels shall be stainless steel.
- C. Glazing Gaskets: Manufacturer's standard dry glazing system.
- D. Brackets and Anchors: Manufacturer's standard high-strength, aluminum units where feasible, otherwise non-magnetic stainless steel; except, at fabricator's option, brackets not exposed to weather or abrasion may be primed steel complying with ASTM A123. Provide non-staining, non-ferrous shims for installation and alignment of window wall work.
  - 1. Provide structural steel deadload and windload anchors for curtain wall mullions.
- E. Hardware: **[Insert]**

## SECTION 08 41 43 ALUMINUM-FRAMED ENTRANCES & STOREFRONTS

### 2.3 STOREFRONT FABRICATION

- A. Provide continuous sill section as required for thermal expansion and to insure a continuous sill gutter to handle infiltrated water. The sill channel shall provide for exterior weepage through weep holes.
- B. Provide and design all flashings, applied door stops and miscellaneous shapes, in matching finish.
- C. Provide HC 200 head anchors to provide for vertical deflection.

### 2.4 CURTAIN WALL FABRICATION

- A. Provide for conventional glass support at horizontal and perimeter members and structural silicone support at intermediate verticals.
- B. Provide extruded pressure plates with flexible (PVC) thermal break material on horizontal members and jambs.
- C. Provisions shall be made at all sealed horizontals to weep moisture accumulations to the exterior. A cover shall be snapped over pressure plate to show only a sharp uninterrupted exterior profile.
- D. Horizontal and jamb framing members shall have a nominal width of 2-1/2 inches. System shall provide for two piece horizontal framing so that all fasteners at intersection of horizontal and vertical members will be concealed. There shall be no exposed fasteners at perimeter sections.
- E. Provide AP 994 top and bottom anchors, and special steel anchors as shown.

### 2.5 ALUMINUM FINISH

- A. Window Walls and Entrances: Fluoropolymer coating system consisting of primer and finish coat of 70 percent Kynar 500 conforming with the requirements of AAMA 2604.
  - 1. Color: Premium color as selected by Architect.
  - 2. Apply finish on all exterior and interior exposed aluminum including formed metal.

## PART 3 - EXECUTION

### 3.1 INSPECTION & COORDINATION

- A. Inspect openings before beginning installation. Verify that rough openings are correct and sills and heads are level.
- B. Coordinate installation with Work specified under other Sections.

### 3.2 INSTALLATION, GENERAL

- A. Install storefront, curtain walls and entrances in accordance with manufacturer's printed instructions and reviewed shop drawings. Provide all required anchors and fasteners. Separate steel anchors from aluminum by paint or isolators. Comply with manufacturer's instructions for protection and handling of fabricated window wall components, with particular attention and care in preservation of applied finishes. Discard or remove and replace damaged members.
- B. Erection Tolerances: Install window wall components plumb, level, accurately aligned and accurately located in reference to column lines and floor levels; adjust Work to conform with the following tolerances (maximum variations).
  - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
  - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
- C. Anchor components securely in place in manner indicated, shimming and allowing for required movements, and provide separators and isolators to prevent corrosion and electrolytic deterioration, and to prevent "freeze up" of moving joints.

### 3.3 CURTAIN WALL INSTALLATION

- A. Install injection molded plastic closure plates at top and bottom of verticals to ensure a continuous perimeter seal.
- B. Slide top and bottom "T" anchors into vertical members. Install verticals plumb and level. Secure top and bottom "T" anchors to structure.

## SECTION 08 41 43 ALUMINUM-FRAMED ENTRANCES & STOREFRONTS

- C. Attach steel anchors to structural steel at south wall.
- D. Provide injected molded end dams for controlling any infiltrated water. Apply sealant to three contact sides of end dams and slide between vertical and horizontal joints as required by manufacturer.

### 3.4 INSTALLATION OF ENTRANCE DOORS

- A. Plumb and align entrance doors, and erect doors and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement and specified wind loads.
- B. Adjust doors for proper operation after installation.

### 3.5 CLEANING & TOUCH-UP

- A. Clean both inside and outside metal surfaces of window wall of all foreign substances. Stained or discolored windows shall be cleaned or refinished.

END OF SECTION

## SECTION 08 42 43 ICU / CCU MANUAL OPERATION DOORS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. ICU / CCU manual operation doors.
- B. ICU / CCU manual operation doors with matching swing doors.
- C. ICU / CCU manual operation doors with matching fixed sidelites.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 08 06 00 - DOOR SCHEDULE.
- C. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.
- D. Section 09 22 26 - NON-STRUCTURAL METAL FRAMING: structural headers.

#### 1.3 QUALITY ASSURANCE

- A. Approved Manufacturer: The following manufacturer is approved:
  - 1. Nabco Entrances Inc., [www.nabcoentrances.com](http://www.nabcoentrances.com).
  - 2. Prior approval required on other manufacturers and subject to meeting dimensioned requirements of design.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Submit dimensioned Shop Drawings, including plans and wall elevations, large-scale details of sections, hardware and glazing details.

### PART 2 - PRODUCTS

#### 2.1 DESCRIPTION

- A. Overhead suspended trackless sliding doors with emergency breakaway feature, custom sizes: Nabco System ICU 1200 Unit.
- B. Mode of Operation: Under normal operating conditions, medical personnel have access by way of the sliding door. When full opening access is required, the sliding door is moved to the breakaway position capturing the transfer pivot. At this location, the door and swing panels become a pivoting unit and can swing 90 degrees giving access to approximately 95 percent of the framed opening. Reset procedures occur in reverse order.

#### 2.2 MATERIALS

- A. Aluminum: Extrusions of manufacturer's standard alloy with clear anodized AA-M12-C22-A41 finish.
- B. Glass: 1/4 inch tempered clear glass.
- C. Construction:
  - 1. Door panels factory assembled with 3/8-16 threaded tie rods spanning full length of top and bottom rails. Snap in glass stop with integral extruded vinyl standoff to accommodate glass flexing.
  - 2. Sliding door suspension provided by two (2) three-wheeled nylon roller assemblies rated at 200 pounds each. Each roller assembly shall have +/- 1/8 inch (3.18mm) of vertical adjustment. Each swing panel shall include one spring-loaded bottom guide roller assembly, incorporating a rubber outer shell and lubricated sealed ball bearing. Guide roller shall be attached to the swing panel with a 1/4 inch (6.35 mm) thick formed guide bracket. All steel brackets and fitting shall be plated for corrosion resistance.
  - 3. Entrance systems shall have door panels attached to a door carrier hanger assembly by means of an adjustable support rod pivot assembly and corrosion resistant adjustable breakaway release latch holding the door panel in the closed position under normal manual operation. The support rod pivot assembly allows door to swing freely in panic mode without sagging. The system shall have breakaway swing panels held in place by means of a top pivot and floor pivot

## SECTION 08 42 43 ICU / CCU MANUAL OPERATION DOORS

plate secured to the floor and a corrosion resistant adjustable breakaway release latch for holding the panel in the closed position. Swing doors shall be into room side.

4. Hardware manufacturer's standard "D-shaped" pull on push side. Recessed handle on swing side.

### 2.3 DOORS

- A. ED Exam Room Entrance Doors:
  1. GT System 2125 manual slider, fixed sidelight, telescopic, handing per Floor Plans.
- B. ED Entrance Doors:
  1. Model GT2125, manual slider, fixed sidelight, trackless, handing per Floor Plans.
  2. Nominal Opening Width: 8'-1 1/2" with 44-inch wide door.
- C. ED Trauma Room Entrance Doors:
  1. Model GT2125T, manual slider, fixed sidelight, trackless, telescopic, handing per Floor Plans.
  2. Nominal Opening Width: XX'-X" with B door opening width of 84 inches.
- D. ED Trauma Room Divider Panels:
  1. Model GT2125TB, manual slider, fixed sidelight, trackless, telescopic, bi-parting.
  2. Nominal Opening Width: Per Floor Plans 26'-0" with B door opening width of 123 inches maximum, include one breakaway panel.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Door Equipment: Installed by manufacturer-approved, factory-trained installers in compliance with manufacturer's recommendations and approved shop drawings.
- B. Set units plumb, level and true to line without warp or rack of frames or panels, in accordance with manufacturer's installation instructions. Anchor headers securely to structural headers.
- C. Upon completion, the doors shall operate smoothly and uniformly contacting weatherstripping at all jambs.

### 3.2 CLEANING

- A. Clean prefinished aluminum surfaces after installation. surfaces shall be free of scratches, blemishes or finger marks

END OF SECTION

## SECTION 08 44 12 ALUMINUM CURTAIN WALLS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide aluminum curtain walls in accordance with the Contract Documents.
- B. Aluminum curtain walls includes Work of the following Sections:
  - 1. Section 04 21 13 – BRICK MASONRY.
  - 2. Section 04 22 00 - CONCRETE UNIT MASONRY: for substrate at perimeter of curtain wall system..
  - 3. Section 08 41 43 – ALUMINUM-FRAMED ENTRANCES & STOREFRONTS: for entrances and storefronts integrated into curtain wall system.
  - 4. Section 07 42 43 - COMPOSITE WALL PANELS: for substrate at perimeter of curtain wall system.
  - 5. Section 07 92 00 – JOINT SEALANTS.
  - 6. Section 08 80 00 – GLAZING: for glazing to be installed in aluminum curtain wall system.
- C. Curtain wall clips.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 03 11 00 –CONCRETE FORMING: for placement of curtain wall clips.
- D. Section 01 36 00 – DELEGATED DESIGN REQUIREMENTS
- E. Section 01 45 21 - TESTING LABORATORY SERVICES: Testing.
- F. Section 07 92 00 - JOINT SEALANTS.

#### 1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA 501.2, Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems.
- B. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7, Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM):
  - 1. ASTM E283, Standard Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors under Specified Pressure Differences across the Specimen.
  - 2. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference.

#### 1.4 SYSTEM DESCRIPTION

- A. Exterior building façade comprised of components or elements, factory-made to high tolerances and quality. Each element, however, is designed as a separate self-contained component without full regard as to how it may be built into most forms of façade construction.
- B. The different components are each selected to serve a purpose and may not be chosen for ease of installation.
- C. Curtain wall system of site-assembled framing members, mullions (vertical) and transoms (horizontal).
- D. Glazing and infill panels are fixed into the framing grid by clamping them into a glazing rebate. Panels may also be fitted as rainscreen, structural silicone glazing or bolted structural glazing.
- E. Stick curtain wall built from standard systems, but with non-standard interfaces with adjacent elements; roof structure, other wall elements, etc.

#### 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Award the Work to a single installer or subcontractor who will be responsible for all Work specified in Sections listed in Paragraph 1.1 B of this Section.

## SECTION 08 44 12 ALUMINUM CURTAIN WALLS

- B. Reference Standards: Except as modified by governing Codes and by this Specification, comply with applicable provisions and recommendations of ASTM E283 and ASTM E331.
- C. Acceptable Manufacturers and Substitutions: Proprietary and nonproprietary systems and products are specified as the Basis of Design. Substitutions may be submitted in accordance with Section 01 60 00 except where specifically specified otherwise or where no provision is listed for alternate manufacturer. For substitute products to be considered:
  - 1. Supporting technical literature, samples, drawings and performance data shall be submitted in order to make a valid comparison of the products involved. Test reports certified by an independent test laboratory shall be made available upon request.
  - 2. Manufacturer's literature shall be highlighted or a written materials description shall be included to indicate which specific items are proposed for Substitution and with which specified or shown items they correspond.
  - 3. Each product or system in the Specification Section when specified to be furnished by a single manufacturer shall be addressed in the Substitution Request.

### 1.6 DESIGN CRITERIA

- A. Provide system and components capable of withstanding wind and seismic loads specified by the IBC as following:
  - 1. Design Wind Load: as indicated on Structural Drawings.
  - 2. Seismic Loads: as indicated on Structural Drawings.
  - 3. Sidesway (Story Drift): Accommodate building story drift as calculated by ASCE 7 Section 12.8.6 and Table 12.12-1, as follows:

<b>Table 1 – SIDESWAY (Story Drift)</b>		
Level	Total ΔM E-W (inches)	Total ΔM N-S (inches)
Roof	0.787	0.894
8th	1.016	1.184
7th	1.139	1.314
6th	1.287	1.396
5th	1.901	1.954
4th	1.350	1.190
3rd	0.659	0.311
2nd	0.125	0.370
1st	0.057	0.026

Story drifts indicated are the maximum floor displacement relative to the level below.

- 4. Live Load Deflection: Accommodate live load deflection of the supporting building floor slab. Live load deflection = span/360.
  - 5. Design of structural fittings is sole responsibility of curtain wall component manufacturers.
- B. Anchor assemblies or connection hardware, including all related connections, tracks, fasteners, etc. for and related to the curtain wall system shall be designed, engineered, furnished and installed as required in compliance with specified design and performance criteria.
  - 1. All such items indicated on the Drawings are schematic and do not necessarily indicate exact required scope, type, shape, or profile.
  - 2. Location and methods of anchoring panels shall be Subcontractor's responsibility, who shall design cladding panels and connections
- C. Design Modifications:
  - 1. Aesthetic modifications to design concept shown on Drawings allowed only as may be necessary to meet performance requirements and coordinate Work.



## SECTION 08 44 12 ALUMINUM CURTAIN WALLS

2. Provide internal mullion reinforcing on curtain wall as required to meet wind loads.
3. Variations in details and materials which do not adversely affect appearance, durability or strength shall be submitted to the Architect for review. Maintain general exterior design concept.

### 1.7 PERFORMANCE REQUIREMENTS

- A. The Installer shall verify that vertical mullions, glass, structural silicone glazing and fasteners will meet tributary wind loads specified under Article 1.5 of this Section.
- B. Provide tight joints and effectively seal component parts of aluminum curtain walls and their joints with contiguous Work against water leakage and air infiltration.
  1. Water leakage is defined as the appearance of uncontrolled water, other than condensation, on any inboard part of window wall, either during testing or under actual weather conditions.

### 1.8 TESTING

- A. Air Infiltration Testing: Shall not exceed 0.05 cfm per foot of crack length when tested at 6.24 pounds per square foot pressure differential, when tested in accordance with ASTM E283.
- B. Water Penetration Testing: Shall have no uncontrolled water leakage when tested at 15 pounds per square foot pressure differential, when tested in accordance with ASTM E331.
- C. Uniform Load Deflection Test: Shall be based on a maximum deflection of L/175 and an allowable stress with a safety factor of 1.65.
- D. Adhesion and Compatibility Testing: The silicone sealant manufacturer shall test all components of aluminum curtain walls coming into contact with sealants for compatibility and adhesion. Submit 9 samples each of each glass, gasket, aluminum material and spacers for testing.
  1. Manufacturer shall also review joint details and structural silicone glazing details and advise Installer in writing if any details do not meet requirements for satisfactory sealing or bonding.

### 1.9 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. List of Curtain Wall Component Suppliers: Before submission of Shop Drawings or Samples, submit a complete listing of products, manufacturers and fabricators for the principal curtain wall components. Architect's review of listed firms will be tentative, subject to review of subsequent Submittals.
- C. Shop Drawing of Mock-Up: Submit Shop Drawing of Mock-Up prior to submission of actual Shop Drawings. Mock-up details shall reflect actual details to be used in the Project.
- D. Samples: Submit samples of component parts, which are specified in other Sections, prior to mock-up. In addition, provide the following:
  1. Sealant samples: Duplicate color chips of manufacturer's standard colors and for Architect's preliminary color selection for mock-up.

### 1.10 MOCK-UP

- A. As soon as practicable, construct Mock-Up aluminum curtain wall as shown on Drawings. Include the following:
  1. Permanent brick surrounds.
  2. Glazed window wall and spandrel section.
  3. Perimeter joint sealant in actual color.
  4. No interior finishes shall cover the Mock-Up.
- B. The mock-up shall be reviewed and approved for aesthetic effects.
- C. After approval for aesthetic effects, water test panel in accordance with AAMA 501.2 in the presence of the Architect and Contracting Officer.
- D. Modifications required due to failure of water test shall be made at no additional cost to

## SECTION 08 44 12 ALUMINUM CURTAIN WALLS

- the Owner.
- E. The approved mock-up will not be part of permanent Work.

### 1.11 WARRANTIES

- A. Aluminum Curtain Walls Warranties: Submit a written warranty for a period of 3 years. Repair or replace aluminum curtain wall Work and correct leaks or other defects in material or workmanship during the warranty period. Warranty shall be signed by the Contractor and the single firm awarded the window wall Work. Warranty shall cover the interface between aluminum roof copings and aluminum curtain walls.
- B. Glass and Finish Warranties: Specified within individual Sections for components.
- C. Sealant Warranties: Provide manufacturer's standard 20-year limited warranty on joint sealing, structural adhesion and anti-staining.

## PART 2 - PRODUCTS

### 2.1 MATERIALS & FABRICATION

- A. As specified in individual Sections listed in Article 1.1 of this Section.
- B. Joint Sealants: For exposed joinery including the surrounds around aluminum window walls and joints between metal panels, and joints between panels and copings:
  - 1. Sealant: Dow Corning 795. No substitutions.
  - 2. Primer: Dow Corning 1200.
  - 3. Backer rod: As specified in Section 07 92 00.

### 2.2 ACCESSORIES

- A. Curtain Wall Clips:
  - 1. Multi-adjustable aluminum clips for edge-of-slab applications.
  - 2. Left and right dead load clips with offset horizontal slot and vertical slot for vertical movement of mullion relative to clip.
  - 3. Acceptable manufacturer: Subject to compliance with requirements, provide "Multi-Adjustable Curtain Wall Clips" manufactured by Halfen Anchoring Systems, [www.halfenusa.com](http://www.halfenusa.com).
- A. Anchoring Embeds:
  - 1. Multi-adjustable aluminum clips for edge-of-slab applications.
  - 2. Left and right dead load clips with offset horizontal slot and vertical slot for vertical movement of mullion relative to clip.
  - 3. Acceptable manufacturer: Subject to compliance with requirements, provide "Multi-Adjustable Curtain Wall Clips" manufactured by Halfen Anchoring Systems, [www.halfenusa.com](http://www.halfenusa.com).

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install products covered under this Section as specified under Sections for individual components listed under Paragraph 1.1 B of this Section.
- B. Install joint sealants per installation requirements specified in Section 07 92 00.

### 3.2 FIELD WATER TESTING

- A. Perform two field water tests of completed sections of aluminum curtain walls. Each section shall consist as a minimum of one story height, approximate 15 feet bay curtain wall.
- B. Perform water tests as specified under Article 1.8 of this Section for Mock-Up in presence of Architect and Contracting Officer.
- C. Water testing shall be performed prior to enclosing window surrounds on interior side.
- D. Select sites where Architect, Contracting Officer and water-testing personnel will have access on exterior of unit.
- E. Additional testing will be ordered by Architect if water leakage occurs during either of field water tests.
  - 1. Make all necessary corrections due to leaks.

SECTION 08 44 12 ALUMINUM CURTAIN WALLS

2. Additional tests shall be at Contractor's expense.

END OF SECTION



## SECTION 08 44 13 GLAZED ALUMINUM CURTAIN WALLS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Glazed aluminum curtain walls, with vision glazing and glass and metal infill panels.
- B. Column covers.
- C. Perimeter sealant.
- D. Firestopping between curtain wall and edge of floor slab.
- E. Aluminum sunshades where indicated on south facade.
- F. Curtain wall clips.
- G. Work of this Section is affected by Delegated Design.
- H. Work of this Section is affected by simultaneous submittal requirements for coordination purposes.

#### 1.2 RELATED SECTIONS

- A. Section 01 33 00 – SUBMITTAL REQUIREMENTS: for submittal requirements.
- B. Section 01 33 12 – COORDINATED SUBMITTAL REQUIREMENTS: for simultaneous submittals requirements for coordination purposes.
- C. Section 01 36 00 – DELEGATED DESIGN REQUIREMENTS: for Bidder-design requirements.
- D. Section 03 30 00 - CAST-IN-PLACE CONCRETE: for weld plates embedded in concrete for attachment of anchors.
- E. Section 05 12 00 - STRUCTURAL STEEL: for steel attachment members.
- F. Section 05 50 00 - METAL FABRICATIONS: for steel attachment devices.
- G. Section 07 26 00 - VAPOR RETARDERS: for perimeter air and vapor seal between glazing system and adjacent construction.
- H. Section 07 84 13 – PENETRATION FIRESTOPPING: for firestop at system junction with structure.
- I. Section 07 92 00 - JOINT SEALANTS: for perimeter sealant and back-up materials.
- J. Section 08 41 13 – ALUMINUM-FRAMED ENTRANCES & STOREFRONTS: for entrance framing and doors.
- K. Section 08 46 00 - AUTOMATIC ENTRANCE DOORS.
- L. Section 08 80 00 – GLAZING:
- M. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: Metal stud and gypsum board wall at interior of curtain wall.
- N. Section 09 91 00 - PAINTING: Field painting of interior surface of infill panels.

#### 1.3 REFERENCES

- A. Aluminum Association (AA):
  - 1. Aluminum Design Manual.
- B. American Architectural Manufacturer's Association (AAMA):
  - 1. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site.
  - 2. AAMA 501.1 - Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure.
  - 3. AAMA 503 - Voluntary Specification For Field Testing of Storefronts, Curtainwalls and Sloped Glazing Systems.
  - 4. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
  - 5. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
  - 6. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  - 7. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
  - 8. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

## SECTION 08 44 13 GLAZED ALUMINUM CURTAIN WALLS

- C. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers.
- D. ASTM International (ASTM):
  - 1. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 3. ASTM B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - 4. ASTM B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
  - 5. ASTM B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 6. ASTM B221M, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
  - 7. ASTM C794, Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
  - 8. ASTM C1184 - Standard Specification for Structural Silicone Sealants.
  - 9. ASTM E90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  - 10. ASTM E283, Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  - 11. ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - 12. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
  - 12. ASTM E413, Classification for Rating Sound Insulation.
  - 14. ASTM E547, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential.
  - 15. ASTM E1105, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
- E. The Society for Protective Coatings (SSPC):
  - 1. SSPC-Paint 20, Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings.
  - 2. SSPC-Paint 25, Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings.
  - 3. SSPC-Paint 25BCS, Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Blast Cleaned Steel; Society for Protective Coatings.

### 1.4 SYSTEM DESCRIPTION

- A. Exterior building façade comprised of components or elements, factory-made to high tolerances and quality. Each element, however, is designed as a separate self-contained component without full regard as to how it may be built into most forms of façade construction.
- B. The different components are each selected to serve a purpose and may not be chosen for ease of installation.
- C. Curtain wall system of site-assembled framing members, mullions (vertical) and transoms (horizontal).
- D. Glazing and infill panels are fixed into the framing grid by clamping them into a glazing rebate. Panels may also be fitted as rainscreen, structural silicone glazing or bolted structural glazing.
- E. Stick curtain wall built from standard systems, but with non-standard interfaces with adjacent elements; roof structure, other wall elements, etc.

## SECTION 08 44 13 GLAZED ALUMINUM CURTAIN WALLS

### 1.5 SYSTEM REQUIREMENTS

- A. Design Requirements:
  - 1. Drawings are diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage, or moisture disposal.
  - 2. Requirements shown by details are intended to establish basic dimension of units, sight lines and profiles of members.
  - 3. Provide concealed fastening.
  - 4. Provide 2 lines of defense against water ingress at all locations.
  - 5. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly.

### 1.6 REGULATORY REQUIREMENTS

- A. Design entrance and storefront system to withstand wind loads and seismic loads according to provisions of Chapter 16 of State of Oregon Structural Specialty Code based on International Building Code.
- B. Doors to comply with accessibility guidelines of The Americans with Disabilities Act (ADA) and accessibility requirements of State Building Code.

### 1.6 QUALITY ASSURANCE

- A. Single Source Responsibility: Award the Work to a single installer or subcontractor who will be responsible for all Work specified in Sections listed in Paragraph 1.1 B of this Section.
- B. Reference Standards: Except as modified by governing Codes and by this Specification, comply with applicable provisions and recommendations of ASTM E283 and ASTM E331.
- C. Acceptable Manufacturers and Substitutions: Proprietary and nonproprietary systems and products are specified as the Basis of Design. Substitutions may be submitted in accordance with Section 01 60 00 except where specifically specified otherwise or where no provision is listed for alternate manufacturer. For substitute products to be considered:
  - 1. Supporting technical literature, samples, drawings and performance data shall be submitted in order to make a valid comparison of the products involved. Test reports certified by an independent test laboratory shall be made available upon request.
  - 2. Manufacturer's literature shall be highlighted or a written materials description shall be included to indicate which specific items are proposed for Substitution and with which specified or shown items they correspond.
  - 3. Each product or system in the Specification Section when specified to be furnished by a single manufacturer shall be addressed in the Substitution Request.

### 1.6 DESIGN CRITERIA

- A. Meet design criteria specified in Section 08 44 12.

### 1.7 PERFORMANCE REQUIREMENTS

- A. Meet performance requirements specified in Section 08 44 12.

### 1.8 TESTING

- A. Test in accordance with the provisions of Section 08 44 12.

### 1.9 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. List of Curtain Wall Component Suppliers: Before submission of Shop Drawings or Samples, submit a complete listing of products, manufacturers and fabricators for the principal curtain wall components. Architect's review of listed firms will be tentative, subject to review of subsequent Submittals.
- C. Shop Drawing of Mock-Up: Submit Shop Drawing of Mock-Up prior to submission of

## SECTION 08 44 13 GLAZED ALUMINUM CURTAIN WALLS

actual Shop Drawings. Mock-up details shall reflect actual details to be used in the Project.

- D. Samples: Submit samples of component parts, which are specified in other Sections, prior to mock-up. In addition, provide the following:
  - 1. Sealant samples: Duplicate color chips of manufacturer's standard colors and for Architect's preliminary color selection for mock-up.

### 1.10 MOCK-UP

- A. As soon as practicable, construct Mock-Up aluminum curtain wall as shown on Drawings. Include the following:
  - 1. Permanent brick surrounds.
  - 2. Glazed window wall and spandrel section.
  - 3. Perimeter joint sealant in actual color.
  - 4. No interior finishes shall cover the Mock-Up.
- B. The mock-up shall be reviewed and approved for aesthetic effects.
- C. After approval for aesthetic effects, water test panel in accordance with AAMA 501.2 in the presence of the Architect and Contracting Officer.
- D. Modifications required due to failure of water test shall be made at no additional cost to Owner.
- E. Approved mock-up will not be part of permanent Work.

### 1.11 WARRANTIES

- A. As specified in Section 08 44 12.

## PART 2 - PRODUCTS

### 2.1 MATERIALS & FABRICATION

- A. As specified in individual Sections listed in Article 1.1 of this Section.
- B. Joint Sealants: For exposed joinery including the surrounds around aluminum window walls and joints between metal panels, and joints between panels and copings:
  - 1. Sealant: Dow Corning 795. No substitutions.
  - 2. Primer: Dow Corning 1200.
  - 3. Backer rod: As specified in Section 07 92 00.

### 2.2 ACCESSORIES

- A. Curtain Wall Clips:
  - 1. Multi-adjustable aluminum clips for edge-of-slab applications.
  - 2. Left and right dead load clips with offset horizontal slot and vertical slot for vertical movement of mullion relative to clip.
  - 3. Acceptable manufacturer: Subject to compliance with requirements, provide "Multi-Adjustable Curtain Wall Clips" manufactured by Halfen Anchoring Systems, [www.halfenusa.com](http://www.halfenusa.com).
- A. Anchoring Embeds:
  - 1. Multi-adjustable aluminum clips for edge-of-slab applications.
  - 2. Left and right dead load clips with offset horizontal slot and vertical slot for vertical movement of mullion relative to clip.
  - 3. Acceptable manufacturer: Subject to compliance with requirements, provide "Multi-Adjustable Curtain Wall Clips" manufactured by Halfen Anchoring Systems, [www.halfenusa.com](http://www.halfenusa.com).

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install products covered under this Section as specified under Sections for individual components listed under Paragraph 1.1 B of this Section.
- B. Install joint sealants per installation requirements specified in Section 07 92 00.

### 3.2 FIELD WATER TESTING



## SECTION 08 44 13 GLAZED ALUMINUM CURTAIN WALLS

- A. Perform two field water tests of completed sections of aluminum curtain walls. Each section shall consist as a minimum of one story height, approximate 15 feet bay curtain wall.
- B. Perform water tests as specified under Article 1.8 of this Section for Mock-Up in presence of Architect and Contracting Officer.
- C. Water testing shall be performed prior to enclosing window surrounds on interior side.
- D. Select sites where Architect, Contracting Officer and water-testing personnel will have access on exterior of unit.
- E. Additional testing will be ordered by Architect if water leakage occurs during either of field water tests.
  - 1. Make all necessary corrections due to leaks.
  - 2. Additional tests shall be at Contractor's expense.

END OF SECTION



PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Extruded aluminum windows with fixed sash; site-glazed.

1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data, Shop Drawings, Samples.
- C. Section 01 36 00 - DELEGATED DESIGN: Bidder-designed elements.
- D. Section 07 62 00 - SHEET METAL FLASHING & TRIM: Interface of components with sheet metal flashing and trim.
- E. Section 07 92 00 - SEALANTS: Joint sealants.
- F. Section 08 80 00 - GLAZING: For insulated glazing.

1.3 REFERENCES

- A. American Architectural Manufacturers Association(AAMA):
  - 1. AAMA/WDMA/CSA 101/IS.2/A440, Standard / Specification for Windows, Doors, and Unit Skylights.
- B. American Society of Testing and Materials (ASTM):
  - 1. ASTM A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 2. ASTM B221, Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 3. ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
  - 4. ASTM E330, Standard Specification for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference.
  - 5. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

1.4 SYSTEM DESCRIPTION

- A. Windows: Thermally broken tubular aluminum sections, shop fabricated, factory pre-finished, related flashings, anchorage and attachment devices. Ready to receive site installed glass.
- B. Classification: Comply with requirements of AAMA Grade and Performance Class HC40, Heavy Commercial Windows.
- C. Glazing: Interior installation.

1.5 PERFORMANCE REQUIREMENTS

- A. Meet requirements of Section 01 36 00.
- B. Manufacturer's stock system, adapted to the applications indicated, to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall to a design pressure of 20 psf, with 37.4 psf negative pressure at corners, as measured in accordance with ANSI/ASTM E330.
- C. Limit mullion deflection to 1/200 of span; with full recovery of glazing materials.
- D. System to accommodate, without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
- E. Limit air leakage through assembly to 0.05 cfm/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf in accordance with ANSI/ASTM E283.
- F. Water Leakage: None, when measured in accordance with ASTM E331 with a test pressure difference of 3.00 lbf/ sq ft.
- G. System to provide for expansion and contraction within system components caused by a cycling temperature range of 120 deg. F.

## SECTION 08 51 13 ALUMINUM WINDOWS

- H. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
  - I. System to accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, deflection of lintel.
- 1.6 QUALITY ASSURANCE
- A. Perform Work in accordance with AAMA 101/IS.2/A440 and applicable general recommendations published by AAMA and AA.
  - B. Provide all aluminum windows produced by a single manufacturer for entire Project.
- 1.7 QUALIFICATIONS
- A. Manufacturer: Company specializing in manufacturing aluminum windows similar to those specified, with minimum three years documented experience.
  - B. Installer: Company specializing in installation of aluminum windows similar to those specified, with minimum three years documented experience, and approved in writing by manufacturer.
- 1.8 SUBMITTALS
- A. Submit under the provisions of Section 01 33 00.
  - B. Shop Drawings:
    - 1. Indicate opening dimensions, framed opening tolerances, affected related Work.
    - 2. Show component dimensions, anchorage and fasteners, glass, internal drainage details.
  - C. Submit two samples of each frame type, 4 inches long, illustrating window frame section and pre-finished aluminum surfaces.
  - D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- 1.9 PRE-INSTALLATION CONFERENCE
- A. Convene one week prior to commencing Work of this Section.
- 1.10 DELIVERY, STORAGE & HANDLING
- A. Protect pre-finished aluminum surfaces with wrapping or stripable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
- 1.11 FIELD REQUIREMENTS
- A. Verify that field measurements are as indicated on Drawings and used in the preparation of Shop Drawings.

## PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
- A. Basis of Design: United States Aluminum Corp., [www.usalum.com](http://www.usalum.com).
  - B. Acceptable substitution: Kawneer North America, [www.kawneer.com/kawneer/north\\_america/en/home.asp](http://www.kawneer.com/kawneer/north_america/en/home.asp).
  - C. Approved Substitution. Submit under the provisions of Section 01 25 13.
- 2.2 MATERIALS
- A. Extruded Aluminum: ANSI/ASTM B221; 6063 alloy, T5 temper.
  - B. Sheet Aluminum: ANSI/ASTM B221; 6063 alloy, T5 temper.
  - C. Fasteners: Non-metallic stainless steel.
  - D. Reinforcement: High-strength aluminum or non-metallic stainless steel, warranted by manufacturer to be non-corrosive and compatible with aluminum components.
  - E. Concrete/Masonry Inserts: Fabricated from hot-dip galvanized steel complying with ASTM A123.
  - F. Glass and Glazing: Insulated glazing as specified under Section 08 80 00.
- 2.3 COMPONENTS

## SECTION 08 51 13 ALUMINUM WINDOWS

- A. Frame Type B: 2 x 4-1/2 inches, offset glazed to back plane. Quality Standard: US Aluminum
  - B. Sheet Aluminum for Custom Modifications: 0.050 inch thick, formed to shapes and sizes shown on Drawings.
- 2.4 SEALANT MATERIALS
- A. Perimeter Sealant and Backing materials: As specified under Section 07 90 00.
  - B. Sealant Used Within System (Not Used for Glazing): Type recommended by manufacturer for joint size and movement; permanently elastic, non-shrinking, and non-migrating.
- 2.5 FABRICATION
- A. Except where more specific or stringent requirements are indicated, provide manufacturer's standard fabrication that complies with indicated Standards.
  - B. Fabricate units that are reglazable without dismantling framing.
  - C. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
  - D. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
  - E. Prepare components to receive anchor devices. Fabricate anchors.
  - F. Arrange fasteners and attachments to ensure concealment from view.
  - G. Provide slotted holes for bolted attachments to allow for thermal movement.
  - H. Prepare components with internal reinforcement for anchorage devices.
  - I. Provide compensation channel at head frame to accommodate expected differential building deflections.
  - J. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
  - K. Provide miscellaneous shapes as required by Details to complete window system and related aluminum elements. See Section 07 62 00 for aluminum panel trimwork that is integrated with window system.
- 2.6 FINISHES
- A. Finish coatings to conform to AAMA 607.1.
  - B. Aluminum Surfaces: Architectural Class I Anodic Coating conforming to AA-M12C22A42.
  - C. Color: As selected by Architect.
  - D. Concealed Steel Items: Galvanized in accordance with ASTM A123 to 2.0 oz/sq ft.
  - E. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify wall openings are ready to receive Work of this Section.
- B. Masonry surfaces shall be visibly dry and free of excess mortar, sand and other construction debris.

### 3.2 INSTALLATION

- A. Install window units in accordance with manufacturer's instructions and in accordance with AAMA 101.
- B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
- E. Install miscellaneous panels to fully integrate with window framing system, using concealed fasteners only.

### 3.3 TOLERANCES

- A. Maximum Variation from Level or Plumb: 0.06 inches from true plane or line, over any 36 inches distance.

## SECTION 08 51 13 ALUMINUM WINDOWS

### 3.4 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Provide metal-framed skylights in accordance with the Contract Documents.
- B. The extent of metal framed extruded tubular aluminum and glass skylight work is shown on the Drawings. The Work includes, but is not limited to:
  - 1. Design, fabrication, and erection of extruded aluminum-framed skylights.
  - 2. Furnishing and installing laminated glass for the skylight units.
  - 3. Aluminum flashings, gutter and downspouts.

1.2. RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of samples.
- C. Section 08 44 12 - ALUMINUM CURTAIN WALLS: for specified finish of aluminum.
- D. Section 09 06 09 - EXTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.

1.3 REFERENCES

- A. American Architectural Manufacturers Association(AAMA):
  - 1. AAMA 2604, Voluntary Specification, Performance Requirements and Test Procedures High Performance Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International (ASTM):
  - 1. ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - 2. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- C. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.

1.4 QUALITY ASSURANCE

- A. All items of Work specified herein shall be furnished by a single firm to assure undivided responsibility. Installer shall be responsible for furnishing the complete package which shall include skylight assembly, glazing, drainage system, sealants and required hardware to provide a complete watertight system.
- B. Manufacturer:
  - 1. Basis of Design: components by Deamor Associates, Inc. [www.deamor.com](http://www.deamor.com).
  - 2. Other manufacturers may submit Substitution Requests under the provisions of Section 01 60 00 with accompanying comparable details and product data.
- C. Provide products that have been tested in accordance with the following methods to verify compliance with specified performance requirements:  
 ASTM E330: Conducted at 1.0 and 1.5 times design load for both positive and negative static pressure; no breakage, component disengagement or permanent distortion is permitted.  
 ASTM E 331: Conducted at 10 pounds per square foot static pressure, with test pressure maintained for full duration of one (1) 15-minute cycle; no uncontrolled water is to appear on interior parts of skylight.

1.5 PERFORMANCE REQUIREMENTS

- A. The skylight systems shall be bidder-engineered to conform to the designs shown on Drawings. The manufacturer shall be responsible for structural design and shall design assemblies to prevent water leakage through skylight systems.
- B. Applicable Code: Chapter 24, International Building Code.
- C. Design Requirements:
  - 1. Design loads shall be determined by the structural engineer in accordance with the applicable local Codes.

## SECTION 08 63 00 METAL - FRAMED SKYLIGHTS

2. Limit deflection of skylight members to 1/180 of their length up to 20 feet and 1/240 over 20 feet, or limit deflection of glass to 3/4 inch over one light, whichever is less.
3. Design fasteners for a 4 to 1 safety factor, based on ultimate loading.
4. Design skylight assemblies to withstand temperature variations up to 120 degrees F without over-stressing glazing, fasteners or framing.
5. Design skylights to prevent excessive noise such as popping and creaking and wind harmonics.
6. Design bearing and edge clearances as required to accommodate expansion and contraction of glazing materials with edge clearance of 1/4 inch minimum to nearest metal surface.
7. Design glass thickness per Code. In addition, glass shall safely support a 250-pound worker under any loading condition.

### 1.6 DEFERRED SUBMITTALS (see definition under Section 01 42 16)

- A. Submit under the provisions of Section 01 33 00.
- B. Submittal Documents: Submit Shop Drawings for fabrication and erection of skylight assemblies and flashings. Include plans and elevations, sections and connection details. Show finishes, anchorage, expansion joints and accessory items.
  1. Submit complete engineering calculations signed and stamped by a Structural Engineer, registered in Washington State, verifying ability of all members and connections to support required loads.
  2. Submit manufacturer's product data on skylight system.
- C. Samples for Verification:
  1. Provide two (2) samples of each specified glazing.
  2. Aluminum finish samples: Include a minimum of 4 samples.

### 1.7 PRODUCT HANDLING

- A. Deliver products to Project Site and install immediately. Do not store materials at Project Site.

### 1.8 WARRANTY

- A. Warranty: Upon completion, submit written warranty by skylight installer agreeing to replace aluminum skylight units which fail in materials or workmanship within five (5) years of date of Final Acceptance. Failure of materials or workmanship shall include but not be limited to leakage, finish deterioration in excess of normal weathering, and defects in accessories, weatherstripping and other components.
  1. Laminated Glass: Submit 5-year warranty agreeing to replace laminated glass that delaminates.
  2. Sealant Warranty: Provide manufacturer's standard 20-year limited warranty on joint sealing, structural adhesion and anti-staining.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Aluminum:
  1. Provide extruded shapes and profiles of manufacturers standard construction for members of the skylight system.
  2. Provide thickness as necessary to comply with the structural loading requirements. Minimum thickness of supporting members shall be 0.100 inches.
  3. Provide aluminum alloy and temper for each shape as recommended by the skylight manufacturer to comply with the requirements of performance, fabrication and finish.
- B. Glazing:
  1. Laminated glass, consisting of heat strengthened clear upper layer with ceramic frit pattern on No. 2 surface, 0.030 inch clear vinyl interlayer, clear heat



## SECTION 08 63 00 METAL - FRAMED SKYLIGHTS

strengthened glass bottom layer. Ceramic frit pattern shall consist of 1/8 inch dots on 1/4 inch centers.

2. Structural glazing sealant: Dow Corning 795, black color.
3. Glass supports: Black open cell foam.
4. Edge channels and drip edge: Black anodized aluminum.
- C. Accessory Materials:
  1. Sheet and plate aluminum: 5052 alloy for flashing, trim, closures and accessories minimum 0.040 inch thick as required to maintain flatness.
    - a. Gutter: 0.090 inch.
    - b. Gutter hangers: 3/8 inch plate.
  2. Fasteners: Non-magnetic, 300 series, stainless steel, engineered as required.
  3. Gutter liner: Stainless steel.
  4. Tapered insulation: Extruded polystyrene.
  5. Downspouts: 0.125 inch wall thickness aluminum pipe.
  6. Downspout straps: 0.125 inch aluminum, bent to circumscribe downspouts.

### 2.2 CONSTRUCTION

- A. Glass shall be attached to the rafters and joints between glass lites shall be sealed with structural silicone sealant.
- B. Cope rafters to curvature of structural pipe supports.
- C. Design connections to be fully concealed.
- D. Fabricate solid bar stock plugs for open ends of rafters.

### 2.3 FABRICATION

- A. Fabricate materials in the manufacturer's shop of the appropriate alloys for the specified finish.
- B. Fabricate the glass supporting members with hairline joints and aligned to within 1/64 inch. Mock-up skylight frames as required to determine dimensional accuracy and alignment.
- C. Pre-tab and shop-fabricate gutter and flashings prior to finishing.
- D. Silicone glue metal edgings to exposed edges of glass. Metal edging at drip edge shall not extend over top surface of glass.

### 2.4 FINISH

- A. After fabrication is complete, prepare all exposed aluminum as required for specified finish.
- B. Apply a 2-coat fluoropolymer paint finish, custom color to match finish specified under Section 08 44 12. Conforming to requirements of AAMA 2604.
  1. Pretreat all components as required by finish manufacturer.
  2. Apply primer as required for approved coating and warranty.
  3. Apply an average 1.0 mil finish coat.

### 2.5 DISSIMILAR METAL PROTECTION

- A. Shop apply 3M "Scotchrap 50," 10 mil, black vinyl corrosion-resistant tape to separate dissimilar metals. Locate so as to be concealed after installation.

### 2.6 SLIP JOINTS

- A. Line slip joints, if required, with high density material suitable for metal surfaces in friction such as Teflon or 3M Scotch Ultra-High Molecular Weight (UHMW) polyethylene tape, with suitable adhesive one side. Provide thickness as required to allow free movement and prevent noise due to thermal expansion.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Inspect the installed supports to verify that they are constructed as designed and are satisfactory for the proper installation of the skylights. Do not proceed with installation until all discrepancies have been corrected.

## SECTION 08 63 00 METAL - FRAMED SKYLIGHTS

### 3.2 INSTALLATION

- A. Install the frames and flashings in accordance with the approved Shop Drawings.
- B. Install the skylights level, plumb and properly aligned with uniform joints and reveals. Drill and tap structural supports for machine screws. Remove and replace any components that may be defective or are damaged during installation.
- C. Structural Silicone Sealant Glazing: Prepare surfaces that will contact sealant and install sealant according to sealant manufacturer's written instructions. Preparation includes, but is not limited to, cleaning and priming. Install foam glass supports. Mechanically fasten glazing in place until sealant cures. Clean excess sealant from surfaces before sealant cures.
- D. Leave skylights free of all protective material, identification labels and excess sealant.
- E. Clean skylight within 5 working days before date of Final Acceptance.

END OF SECTION

## SECTION 08 71 00 DOOR HARDWARE

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide door hardware in accordance with the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data, Hardware Schedule, templates, special tools, Keying Schedule.
- C. Section 01 78 23 - Operation & Maintenance Data: Submittal of operation and maintenance data.
- D. Section 08 11 13- STEEL DOORS & FRAMES: Mounting heights.
- E. Section 08 14 16 - FLUSH WOOD DOORS: Blocking in wood doors for closer attachment.
- F. Section 08 41 13 - ALUMINUM-FRAMED ENTRANCES & STOREFRONTS: Hardware on aluminum entrances.

#### 1.3 REFERENCES

- A. Builders Hardware Manufacturers Association (BHMA):
  - 1. ANSI / BHMA 156.18, Standard for Materials and Finishes.
- B. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.
- C. National Fire Protection Association (NFPA):
  - 1. NFPA 80, Standard for Fire Doors and Other Opening Protectives.

#### 1.4 QUALITY ASSURANCE

- A. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, and who is, or who employs an experienced architectural consultant who is available, at reasonable times during the course of the Work, for consultation about Project's hardware requirements, to Owner, Architect and Contractor.
- B. Hardware shall be suitable and adapted for its required use and shall fit its designated location. The scheduled hardware indicates design intent and level of quality. Should any hardware as shown, specified or required fail to meet the intended requirements or require Substitution to suit or fit the designated location, determine the correction or modification necessary and indicate proposed modification on Hardware Submittal.
  - 1. Verify and provide appropriate strikes for locks and latches specified. Provide dustproof strikes for flush bolts and dead bolts.
- C. Codes and Standards: Unless otherwise noted, comply with the following:
  - 1. International Building Code (IBC).
  - 2. Review hardware for compliance with IBC Chapter 11.
- D. Provide engineering and / or design services for electrified door hardware such as wiring diagrams and coordination of components and interfacing of power and fire alarm systems. Power supplies are scheduled for all electric hardware but may serve more than a single opening. Review operation of doors and provide interfaces on power supplies as required. Provide accessories and cable as required for complete operation.
- E. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA 80 and requirements of the IBC. Provide only hardware which has been tested and listed by UL or FM for types and sizes of doors required and complies with requirements of door and door frame labels.
- F. Warranties: Furnish manufacturer's standard ten (10) year warranty for all closers.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturers technical product data for each item of hardware. Include whatever information may be necessary to show compliance with requirements, and include instructions for installation.

## SECTION 08 71 00 DOOR HARDWARE

- C. Hardware Schedule: Submit Final Hardware Schedule identifying each door or opening by the number used in the Contract Documents. Coordinate hardware with doors, frames and related Work to ensure proper size, thickness, hand, function and finish of hardware.
  - 1. Final Hardware Schedule content: Prepare Schedule indicating complete designations of every item required for each door or opening. Include the following information:
    - a. Type, style, function, size and finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
    - d. Mounting locations for hardware.
    - e. Door and frame sizes and materials.
    - f. Wiring diagrams for controlled access doors.
- D. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check Shop Drawings of such other Work, to confirm that adequate provisions are made for proper location and installation of hardware.
- E. Special Tools: Provide to the Owner two sets of any special tools shipped with the door hardware products required for maintenance and installation. Deliver to Owner at completion of Work.
- F. Operations and Maintenance Data: Submit maintenance manuals, which shall include as-built Hardware Schedule, catalog cuts, template lists with templates and warranty information. One additional copy shall either be delivered with the permanent keys or given separately to the Engineering Department at Substantial Completion. This copy shall contain parts data for exit devices, locksets and closers and catalog cuts of all electrical products, to include manufacturer's name.
- G. Keying Schedule: After receipt of the approved Door Hardware Schedule, the hardware supplier shall meet with the Owner to determine the keying requirements for the Project. This request shall be made through the Contractor. At this meeting, the keying system shall be discussed and all lockset functions reviewed to insure they are functionally correct. At the same meeting, the electrical operations and conditions affecting the access controls and other electronic operators and controls shall be reviewed and confirmed. Four complete copies of the keying schedule and explanations of the operation of the electronic hardware shall be submitted to the Contractor for distribution to the appropriate parties. This document shall contain riser diagrams and point-to-point wiring diagrams to facilitate the correct installation of the material.

### 1.6 PRODUCT HANDLING

- A. Tag each item or package separately, with identification related to Final Hardware Schedule, and include basic installation instructions with each item or package. Save installation instructions for complex hardware such as closers and turn over to Owner.
- B. Deliver individually packaged hardware items at the proper times to the proper locations (shop or Project Site) for installation.
- C. Provide secure lock-up for hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the Work will not be delayed by hardware losses, both before and after installation.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED HARDWARE

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of door hardware is indicated in Door Hardware Schedule at end of this Section. Products are identified by using hardware designation numbers of the following:

## SECTION 08 71 00 DOOR HARDWARE

1. Manufacturer's product designations: One or more manufacturers are listed for each hardware type required. Provide either the product scheduled, or, where more than one manufacturer is listed, the comparable product of one of the other manufacturers which comply with requirements including those specified elsewhere in this Section.
2. Alternate manufacturers: Where more than one acceptable manufacturer is listed, the listing does not approve all products of the alternate manufacturers. Review the details and Project requirements, especially projections and setbacks, to determine that the alternate product conforms to the Project design.

### 2.2 ACCEPTABLE MANUFACTURERS

- A. Locks and Latches: Corbin Russwin, Schlage
- B. Hinges: Bommer, Hager
- C. Surface Mounted Closers: Corbin Russwin, LCN
- D. Overhead Stops: Rixson, Glynn Johnson
- E. Flush Bolts and Coordinators: Ives, Glynn Johnson, DCI
- F. Wall Stops: Trimco, Ives, Glynn Johnson
- G. Door Plates: IPC
- H. Thresholds: Pemko
- I. Door Gaskets and Astragals: Pemko
- J. Electromagnetic Holders: Rixson
- K. Electric Strikes: Rofu, Von Duprin
- L. Exit Devices: Von Duprin
- M. Power Supplies: Locknetics\*, Von Duprin
- N. Pivots: Rixson
- O. Coordinators: DCI, Glynn Johnson
- P. Continuous Hinge: Pemko
- Q. Electric Hinge Modification: Architectural Control Systems, Inc.

### 2.3 MATERIALS AND FABRICATION

- A. Hand of Door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- B. Finish: Finish of locksets, butts, bolts, door stops and exit devices shall be 626 per ANSI / BHMA 156.18. Closers shall be manufacturer's standards silver colored finish (SBL) unless otherwise noted.
  1. Thresholds shall be clear aluminum.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- D. Furnish phillips flat-head screws for installation, with each hardware item unless otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other Work, to match finish of such other Work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
- E. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard unit of the type specified are available with concealed fasteners. **Do not use thru-bolts for installation of closers, magnetic holders and exit devices.**

### 2.4 BUTTS

- A. Type: As scheduled.
- B. Size:
  1. Doors under 3'-6" wide: 4-1/2" x 4-1/2".
  2. Doors 3'-6" wide and over: 5" x 4-1/2".
- C. Quantity: Three (3) each up to and including 90 inches in height. Add one additional hinge for every additional 30 inches or fraction thereof.
- D. All exterior outswinging doors to have non-removable pins (NRP set screw in barrel).

## SECTION 08 71 00 DOOR HARDWARE

### 2.5 LOCK CYLINDER AND KEYING

- A. Existing System: Grandmasterkey the locks to the Owner's existing Russwin system.
- B. Recore Cylinders: Equip locks with 6-pin removable core cylinders with Russwin keyway as determined by Owner. Provide construction master key system which permits voiding of construction keys without cylinder removal.
- C. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change keys for each lock which is not designated to be keyed alike with a group of related locks.
  - 1. Permanently inscribe each key with number or lock that identifies cylinder manufacturer key symbol, and notation "DO NOT DUPLICATE".
  - 2. Key material: Provide keys of nickel silver only.
  - 3. Key quantity: Furnish keys in quantities as follows:
    - a. 3 each GMKs. (*On new buildings only.*)
    - b. 6 each MKs.
    - c. 3 each control keys.
    - d. 3 each change keys per keyed alike group.

### 2.6 LOCKS, LATCHES AND BOLTS

- A. Design: Lever, LWA unless otherwise noted.
- B. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
- C. Lock Throw: Comply with UL requirements for throw of bolts and latch bolts on fire-rated openings.
- D. Bevels: Except as otherwise in Door Schedule remarks, provide lockfronts with 93 degree bevels and coordinate any variances with Door Shop Drawings.

### 2.7 CLOSERS AND DOOR CONTROL DEVICES

- A. Size of Units: Except for fire exit doors, comply with State barrier-free requirements for size of door control unit, depending upon size of door, and frequency of use.
  - 1. Fire exit door opening and closing forces shall comply with IBC Section 1008.1.2.
- B. Overhead Closers: Provide non-sized, full feature door closers as hereinafter scheduled. Door closers shall have separate valves regulating speed, latch and backcheck position.
- C. Provide regular arms for all overhead closers, except where parallel arm closers are scheduled to install closers on the side of doors away from corridors and public spaces.
- D. Wall Stops: Provide fasteners appropriate to the mounting surface.
- E. Coordinators: Provide full width coordinators, surface applied to face of stops. Provide necessary filler units and mounting brackets for stop mounted hardware as required for a complete installation.
- F. Door Control Coordination: Verify compatibility of door holders, closers, coordinators and flush bolts, and propose Substitutions where specified hardware is incompatible.

### 2.8 DOOR TRIM

- A. Fabricate door plates not more than 1-1/2 inches less than door width on stop side, times the height indicated. Height indicated is measurement from finished floor.
  - 1. PVC plates: 0.060 inch thick, Acrovyn by Construction Specialties Group. Color as listed on Architectural Color and Materials List.
  - 2. Stainless steel plates: 0.050 inch thick, Type 304, satin finish with countersunk drilled holes.
  - 3. Where vision panels occur, trim armor plate so that top of plate butts to vision panel frame.
  - 4. Provide lock cutouts by Installer where protection plates occur at locks.
  - 5. Where doors are scheduled to receive armor plates and edge guards, butt armor plate to edge guard.
- B. Fabricate edge guards of Type 304 stainless steel, in profiles as scheduled, unpunched. Provide factory hinge cutouts. Align tops of edge guards with armor plates.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

## SECTION 08 71 00 DOOR HARDWARE

- A. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing Work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- B. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- C. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry Standards.

### 3.2 HARDWARE APPLICATION

- A. Door Closers:
  - 1. General: Verify each head condition prior to furnishing door closers; make required modifications or changes due to detailed conditions.
  - 2. Surface mounted on door: Surface shoe application for standard operation and soffit plate application for parallel arms.
  - 3. Install on steel doors with factory-supplied screws or particle board screws on wood doors.
- B. Door Trim: Install PVC door plates, edge guards and door shoes on wood doors with 3M "Fastbond 30" contact cement, or approved equal adhesive.
  - 1. Install stainless steel door plates and edge guards on steel doors with flathead stainless steel screws.
- C. Electronic Hardware: Provide resistors and other necessary components per manufacturer's wiring diagram. Install power supply units above ceilings.
- D. Thresholds: Set in single component grey colored polyurethane sealant and caulk all perimeter joints to provide watertight installation.

### 3.3 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to Acceptance or occupancy of a space or area, return to the Work during the week prior to Acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

### 3.4 POST-OCCUPANCY SERVICES

- A. Approximately six (6) months after Substantial Completion, the Installer shall return to the Project and make any necessary adjustments to the hardware to restore proper operational function of doors and hardware. Consult with and instruct Owner's personnel in any recommended additions or maintenance procedures. Replace hardware items that have deteriorated or failed due to faulty design or installation. Prepare a written report of current or predictable problem(s) (of a substantial nature) in the hardware performance. If there is a hardware problem the Installer cannot resolve, the finish hardware supplier and a representative of the manufacturer of the product concerned shall be contacted. At a mutually convenient time, the Installer, the hardware supplier and the manufacturer's representative shall meet at the Project Site to review and try to resolve the problem. This meeting shall be at no charge to the Owner or Contractor unless the problem is determined to be the result of faulty installation.

### 3.5 HARDWARE SCHEDULE

- A. Finish hardware scheduled herein should not be construed as a complete Hardware Schedule and shall only be considered as an indication of the hardware design and function requirements. Examine the Drawings and Door Schedule, and provide all

## SECTION 08 71 00 DOOR HARDWARE

necessary or additional hardware components as required for the doors to operate as intended or required by UL or by Code.

1. Provide silencers on all openings not scheduled to receive gaskets. Silencers are not indicated on Hardware Schedule.
- B. Hardware Types: Furnish the following hardware for the doors shown in the Door Schedule:

END OF SECTION



# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 001

6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB1 OR MB2	689	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	CLOSER W/STOP & HO	4111 SHCUSH	689	LCN
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
2	EA	DOOR SWEEP	C627A	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 002

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 003

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
2	EA	PULL/PUSHBAR	9190-2-NO	630	IVE
2	EA	SURFACE CLOSER	4011	689	LCN
1	EA	OVERHEAD STOP	100S	630	GLY
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	POWER SUPPLY	PS873	GRY	VON
1	EA	MOTION SENSOR	SCAN II-W	WHT	SCE
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

DELAYED EGRESS ON PUSH SIDE WITH CARD READER OVERRIDE. MOTION SENSOR ON LOBBY SIDE- POINT MOTION SENSOR DOWN ON OPENING SO DOORS DO NOT ACCIDENTALLY RELEASE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 004

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE.

## HW SET: 005

1	SET	PIVOT SET	7253	626	IVE
1	EA	EMERGENCY DOOR STOP	ES-1	626	STA
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	PRIVACY W/INDICATOR	L9496T 03A L583-363	626	SCH
1	EA	MORTISED SEALS	5025ANB (HEAD & JAMBS)	AL	PEM
1	EA	CONCEALED CLOSER	6031 BUMPER	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	EA	DOUBLE LIP STRIKE	DLS (CUSTOM STRIKE SIMILAR TO STANLEY DLS)	630	TIC

PRIVACY LOCK WITH OCCUPANCY INDICATOR. DOOR NORMALLY UNLOCKED. DOOR LOCKED BY THUMBTURN INSIDE ROOM AND INDICATOR WILL SHOW "OCCUPIED." TURNING LEVER ON INSIDE RETRACTS THUMBTURN AND ALLOWS FREE EXITING PLUS CHANGES INDICATOR BACK TO "UNOCCUPIED." EMERGENCY RESCUE HARDWARE ALLOWS DOOR TO BE PULLED OPEN IF SOMEONE EVER FALLS BEHIND AND BLOCKS DOOR. MORTISE RADIUS DOOR EDGES AND TOP EDGE FOR KERFED SEALS.

## HW SET: 006

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	FIRE EXIT HARDWARE	9827EO-F-LBR	626	VON
1	SET	DOOR EDGES	555	600	NGP
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	MAGNETIC HOLD-OPEN	SEM 7850	AL	LCN
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP

DOORS MUST BE MANUFACTURED BY ALGOMA TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE.

EXIT ONLY PANIC DEVICES IN EACH DIRECTION.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 007

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 009

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03A	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

PASSAGE LATCH- ALWAYS UNLOCKED ON EACH SIDE.

## HW SET: 010

ALL HARDWARE BY DOOR MANUFACTURER

## HW SET: 011

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 012

6	EA	HINGE	5PB1 4.5 X 4.5 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
1	EA	OVERHEAD STOP	450S	630	GLY
1	EA	WALL STOP	WS407CVX	630	IVE
4	EA	SILENCER	SR64	GRY	IVE

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE. INACTIVE LEAF LOCKED AND UNLOCKED USING FLUSHBOLTS ON DOOR EDGE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 013

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ENTER WITH KEY OR CARD READER. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 014

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 015

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE

DOOR MUST HAVE A MINIMUM 5 1/2" VERTICAL STILE TO INSTALL SPECIFIED LOCKSET.  
CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 016

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 017

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 018

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 019

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03A	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

PASSAGE LATCH- ALWAYS UNLOCKED ON EACH SIDE.

## HW SET: 020

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	C627A	AL	NGP
1	EA	THRESHOLD	613	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- LOCKED & UNLOCKED BY KEY OR CARD ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 021

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98NL-F	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	SURFACE CLOSER	4111 CUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM TYPE FUNCTION- ALWAYS TAKES A KEY TO ENTER. CAN ALWAYS EXIT FROM INSIDE BY PUSHING PANIC BAR.

## HW SET: 022

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98NL-F	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP

STOREROOM TYPE FUNCTION- ALWAYS TAKES A KEY TO ENTER. CAN ALWAYS EXIT FROM INSIDE BY PUSHING PANIC BAR.

## HW SET: 023

1	EA	PRIVACY W/INDICATOR	L9496L 03A L583-363 XL12-196	626	SCH
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VERIFY CONDITION OF EXISTING SMOKE GASKET AND FURNISH IF REQUIRED. DOOR MAY BE REQUIRED TO BE DOUBLE ACTING WITH EMERGENCY RESCUE HARDWARE- IF THIS IS THE CASE, MAKE HARDWARE LIKE HARDWARE SET 005. PRIVACY INDICATOR LOCKSET.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 024

6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW4	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	EU STOREROOM LOCK	L9080TEU 03A	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB1 OR MB2	689	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	CLOSER W/STOP & HO	4111 SHCUSH	689	LCN
2	EA	KICK PLATE	8400 12" X 1" LDW	630	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
2	EA	DOOR SWEEP	C627A	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 025

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 026

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 027

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	DELAYED CLOSER	4111 DEL EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 028

6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB1 OR MB2	689	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
2	EA	KICK PLATE	8400 12" X 1" LDW	630	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
2	EA	DOOR SWEEP	C627A	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 029

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98NL-F	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM TYPE FUNCTION- ALWAYS TAKES A KEY TO ENTER. CAN ALWAYS EXIT FROM INSIDE BY PUSHING PANIC BAR.



# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 030

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	INSTITUTION LOCK	L9082T 03A	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

DOUBLE KEYED LOCKSET- REQUIRES A KEY TO GO EACH DIRECTION.

## HW SET: 031

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 032

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98NL-F	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	C627A	AL	NGP
1	EA	THRESHOLD	613	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM FUNCTION- PUSH PANIC DEVICE BAR FOR DIRECTION OF EGRESS, LOCKED LEVER ON PULL SIDE OF DOOR FOR KEY OR CARD ACCESS.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 033

6	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT-2	689	VON
1	EA	PANIC HARDWARE	9847EO-LBR	626	VON
1	EA	PANIC HARDWARE	9847L-LBR E996L-03	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 12" X 1" LDW	630	IVE
2	EA	WALL STOP & HOLDER	WS45	626	IVE
4	EA	SILENCER	SR64	GRY	IVE
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

LEVER TRIM IS A CLASSROOM TYPE FUNCTION- LOCKED & UNLOCKED BY KEY OR CARD ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE BY PUSHING PANIC BAR.

## HW SET: 034

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 035

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE. VERTICAL DOOR STILE MUST BE AT LEAST 5 1/2" WIDE TO ACCEPT SPECIFIED LOCKSET.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 036

6	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
2	EA	SGL DUMMY TRIM	L0170 03A	626	SCH
2	EA	ROLLER LATCH	RL32 (TOP MOUNT)	626	IVE
2	EA	OVERHEAD STOP	450S	630	GLY
4	EA	SILENCER	SR64	GRY	IVE

DUMMY LEVERS WITH ROLLER LATCHES- NO LOCK.

## HW SET: 037

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 038

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT-2	689	VON
1	EA	FIRE EXIT HARDWARE	98L-F E996L-03-FS	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873	GRY	VON
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

STOREROOM TYPE FUNCTION- PUSH PANIC DEVICE BAR FOR DIRECTION OF EGRESS, LEVER ON PULL SIDE OF DOOR LOCKED/UNLOCKED BY KEY OR CARD READER. LEVER ON STAIRWELL SIDE TO UNLOCK ON FIRE ALARM ACTIVATION. POWER SUPPLY REQUIRES 110VAC AND N.C. FIRE ALARM CONNECTION (PROVIDE THE NECESSARY QUANTITY OF POWER SUPPLIES FOR EACH STAIRWELL.)

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 039

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98NL-F	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM TYPE FUNCTION- PUSH PANIC DEVICE BAR FOR DIRECTION OF EGRESS, LOCKED ON PULL SIDE OF DOOR FOR KEY OR CARD ENTRANCE.

## HW SET: 040

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW4	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	EU STOREROOM LOCK	L9080TEU 03A	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- LOCKED AND UNLOCKED BY KEY OR CARD ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 041

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	PULL/PUSHBAR	9190-2-NO	630	IVE
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE

PUSH/PULL OPERATION- NO LOCK.

## HW SET: 042

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	ROLLER LATCH	RL32 (LOCK EDGE MOUNT)	626	IVE
1	SET	DOOR PULL	8102-8-J	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	PROVIDED BY DOOR MANUFACTURER		

PUSH/PULL OPERATION WITH ROLLER LATCH TO KEEP DOOR IN CLOSED POSITION WHEN DESIRED- NO LOCK.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 043

3	EA	HINGE	5PB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OVERHEAD STOP	450S	630	GLY
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 044

1	SET	PIVOT SET	7230F	630	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363 XL11-515	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE. LEAD LINE ALL DOOR PENETRATIONS.

## HW SET: 046

1	SET	PIVOT SET	7230F	630	IVE
1	EA	PASSAGE SET	L9010 03A XL11-515	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

PASSAGE LATCH- ALWAYS UNLOCKED ON EACH SIDE. LEAD LINE ALL DOOR PENETRATIONS.

## HW SET: 047

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 048 - NOT USED

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 049

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 050

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8302-8 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP & HOLDER	WS45	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

PUSH/PULL OPERATION- NO LOCK.

## HW SET: 051

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	SET	LEVER TRIM	L9010 03A LLL X LLL X LESS LOCK CASE	626	SCH
1	EA	PASSAGE LATCH	8525	626	ACC
1	EA	OVERHEAD STOP	100S	630	GLY
1	SET	SEALS	PROVIDED BY DOOR MANUFACTURER		

PASSAGE LATCH- S LABEL DOOR, NEEDS TO LATCH- PUSH/PULL NOT PERMITTED.

## HW SET: 052

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	PRIVACY W/INDICATOR	L9496L 03A L583-363 XL12-196	626	SCH
1	EA	OVERHEAD STOP	410S	630	GLY
1	SET	SEALS	PROVIDED BY DOOR MANUFACTURER		

PRIVACY LOCK WITH OCCUPANCY INDICATOR. DOOR NORMALLY UNLOCKED. DOOR LOCKED BY THUMBTURN INSIDE ROOM AND INDICATOR WILL SHOW "OCCUPIED." TURNING LEVER ON INSIDE RETRACTS THUMBTURN AND ALLOWS FREE EXITING PLUS CHANGES INDICATOR BACK TO "UNOCCUPIED." VERTICAL DOOR STILE MUST BE AT LEAST 5 1/2" WIDE TO ACCEPT SPECIFIED LOCKSET.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 053

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	OVERHEAD STOP	100S	630	GLY
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE.

## HW SET: 054

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE.

## HW SET: 055

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 056

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 057

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	OVERHEAD STOP	900S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 058

3	EA	HINGE	5PB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OVERHEAD STOP	450S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.



# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 059

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436	626	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE.

## HW SET: 060

6	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	AUTO. OPERATOR	9553 RF DOUBLE EGRESS	628	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
4	EA	SILENCER	SR64	GRY	IVE
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

PUSH PLATES EACH DIRECTION- NO LOCKING. AUTO OPERATOR REQUIRES 110VAC.

## HW SET: 061

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	DBL KEY LOCK	L9466T 03A	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211AL FSE 24VDC	630	VON
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	PROVIDED BY DOOR MANUFACTURER		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

DBL KEY LOCK- LEVER ON EACH SIDE RETRACTS LATCHBOLT. KEY ON EACH SIDE RETRACTS OR THROWS DEADBOLT (LEVERS DO NOT RETRACT DEADBOLT.) CARD READER CONTROLLED.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 062

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	DBL KEY LOCK	L9466T 03A	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211AL FSE 24VDC	630	VON
1	EA	OVERHEAD STOP	100S	630	GLY
1	SET	SEALS	PROVIDED BY DOOR MANUFACTURER		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

DBL KEY LOCK- LEVER ON EACH SIDE RETRACTS LATCHBOLT. KEY ON EACH SIDE RETRACTS OR THROWS DEADBOLT (LEVERS DO NOT RETRACT DEADBOLT.) CARD READER CONTROLLED.

## HW SET: 063

3	EA	HINGE	5BB1HW 5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD98NL	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 24VDC	630	VON
1	EA	AUTO. OPERATOR	9542 RF	628	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

FURNISH AUTO OPERATOR FOR TEMPORARY AMBULANCE ENTRANCE. STOREROOM TYPE FUNCTION- ALWAYS TAKES A KEY TO ENTER. CAN ALWAYS EXIT FROM INSIDE BY PUSHING PANIC BAR. CARD READER UNLOCKS ELECTRIC STRIKE AND ALLOWS ENTRANCE EITHER MANUALLY OR BY PUSHING AUTO OPERATOR BUTTON. EXTERIOR AUTO OPERATOR BUTTON ENABLED BY CARD READER. INTERIOR AUTO OPERATOR BUTTON TO ALWAYS UNLOCK STRIKE AND POWER DOOR OPEN WHEN PRESSED.

## SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 064

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98NL-F	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 24VDC	630	VON
1	EA	AUTO. OPERATOR	9542 RF	628	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

STOREROOM TYPE FUNCTION- PUSH PANIC DEVICE BAR FOR DIRECTION OF EGRESS, KEY OR CARD FOR ENTRY. FURNISH AUTO OPERATOR FOR TEMPORARY AMBULANCE ENTRANCE. PUSHING EITHER BUTTON UNLOCKS ELECTRIC STRIKE AND OPENS DOOR- BUTTON ON STAIRWELL SIDE CONTROLLED BY CARD READER.

## HW SET: 065

3	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD98NL	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM TYPE FUNCTION- LOCKED & UNLOCKED BY KEY OR CARD ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE BY PUSHING PANIC BAR.

## HW SET: 066

1	SET	PIVOT SET	7230F	630	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	DELAYED CLOSER	4111 DEL EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE. LEAD LINE ALL DOOR PENETRATIONS.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

HW SET: 067 - NOT USED

HW SET: 068

3	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	630	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

HW SET: 069

3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	L9080T 03A	630	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011 SRI	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	C627A	AL	NGP
1	EA	THRESHOLD	613	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE

HW SET: 070

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436	626	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 071

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE.

## HW SET: 072

2	SET	PIVOT SET	7230F	630	IVE
1	EA	AUTO FLUSH BOLT	FB41T	630	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363 XL11-515	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	WALL STOP & HOLDER	WS45	626	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE. LEAD LINE ALL DOOR PENETRATIONS.

## HW SET: 073

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OVERHEAD STOP	450S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 074

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8302-8 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

## HW SET: 075

6	EA	HINGE	5PB1 4.5 X 4.5 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB457	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	OVERHEAD STOP	450S	630	GLY
4	EA	SILENCER	SR64	GRY	IVE

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE. INACTIVE LEAF LOCKED AND UNLOCKED USING FLUSHBOLTS ON DOOR EDGE.

## HW SET: 076

1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	MORTISE CYLINDER	20-771T	626	SCH
BALANCE OF HARDWARE BY DOOR MANUFACTURER					

VERIFY DOOR AND FRAME TYPE. (HARDWARE MAY OR MAY NOT BE FURNISHED BY DOOR MANUFACTURER.) CARD READER IS REQUESTED ON 3017XA- VERIFY DOOR DESIGN AND FURNISH NECESSARY PRODUCTS TO MAKE CARD READER FUNCTION PROPERLY.

## HW SET: 077

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 078

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE. VERIFY IF DOOR CAN SWING 180DEG. TO WALL.

## HW SET: 079

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

CLASSROOM LOCKSET- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 080 - NOT USED

## HW SET: 081

3	EA	HINGE	5PB1 4.5 X 4.5 NRP	652	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 082

3	EA	HINGE	5PB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 083

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	PRIVACY W/INDICATOR	L9496T 03A L583-363	626	SCH
1	EA	OVERHEAD STOP	410S	630	GLY
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

PRIVACY LOCK WITH OCCUPANCY INDICATOR. DOOR NORMALLY UNLOCKED. DOOR LOCKED BY THUMBTURN INSIDE ROOM AND INDICATOR WILL SHOW "OCCUPIED." TURNING LEVER ON INSIDE RETRACTS THUMBTURN AND ALLOWS FREE EXITING PLUS CHANGES INDICATOR BACK TO "UNOCCUPIED."

## HW SET: 084

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD98NL	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

VERIFY IF PANIC HARDWARE IS REQUIRED ON THIS ELECTRICAL ROOM. STOREROOM TYPE FUNCTION- ALWAYS TAKES A KEY TO ENTER. CAN ALWAYS EXIT FROM INSIDE BY PUSHING PANIC BAR.

## HW SET: 085

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD98NL	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 24VDC	630	VON
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM TYPE FUNCTION- ALWAYS TAKES A KEY TO ENTER. CAN ALWAYS EXIT FROM INSIDE BY PUSHING PANIC BAR. CARD READER UNLOCKS ELECTRIC STRIKE AND ALLOWS ENTRANCE.



# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 086

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	SET	LEVER TRIM	L9010 03A LLL X LLL X LESS LOCK CASE	626	SCH
1	EA	PASSAGE LATCH	8525	626	ACC
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	OVERHEAD STOP	100S	630	GLY

PASSAGE LATCH- NO LOCK.

## HW SET: 087

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8302-8 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	FLOOR STOP	FS436	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

PUSH/PULL- NO LOCK

## HW SET: 088

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8302-8 6" X 16"	630	IVE
1	EA	AUTO. OPERATOR	9542 RF	628	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

PUSH/PULL WITH AUTO OPERATOR- NO LOCK.

## HW SET: 089

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8302-8 6" X 16"	630	IVE
1	EA	AUTO. OPERATOR	9531 RF	628	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
1	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

AUTO OPERATOR REQUIRES 110VAC. PUSH/PULL OPERATION- NO LOCK.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 090

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436	626	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 091

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03A	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

PASSAGE LATCH- ALWAYS UNLOCKED ON EACH SIDE.

## HW SET: 092

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD98NL	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

VERIFY IF PANIC HARDWARE IS REQUIRED ON THIS ELECTRICAL ROOM. STOREROOM TYPE FUNCTION- ALWAYS TAKES A KEY TO ENTER. CAN ALWAYS EXIT FROM INSIDE BY PUSHING PANIC BAR.

## HW SET: 093

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8302-8 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

PUSH/PULL- NO LOCK.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 094

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03A	626	SCH
1	EA	WALL STOP	WS407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

PASSAGE LATCH- ALWAYS UNLOCKED ON EACH SIDE.

## HW SET: 095

3	EA	HINGE	5PB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 096

6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB1 OR MB2	689	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 12" X 1" LDW	630	IVE
2	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 097

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	OVERHEAD STOP	450S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 098

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	FLOOR STOP	FS436	626	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 099

3	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	L9080T 03A	630	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLOSER W/STOP & HO	4111 SHCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DRIP CAP	16A	AL	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 100

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

## HW SET: 101

6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9847EO-F	626	VON
1	EA	FIRE EXIT HARDWARE	9847NL-F	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	SET	MEETING ASTRAGAL	600A	AL	NGP
2	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

STOREROOM TYPE LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE BY PUSHING PANIC BARS.

## HW SET: 102

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	SURFACE CLOSER	4011	689	LCN
2	EA	OVERHEAD STOP	100S	630	GLY
2	EA	KICK PLATE	8400 12" X 1" LDW	630	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE

# SECTION 08 71 02 DOOR HARDWARE GROUPS

HW SET: 103

6	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT-2	689	VON
1	EA	FIRE EXIT HARDWARE	QEL9827EO-F-LBR	626	VON
1	EA	FIRE EXIT HARDWARE	QEL9827L-F-LBR 996L-03	626	VON
2	EA	<i>PRIMUS CORE ONLY 20-740</i>		626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	MORTISE CYLINDER	20-771T	626	SCH
1	SET	MEETING ASTRAGAL	600A	AL	NGP
1	EA	AUTO. OPERATOR	9553 RF PUSH	628	LCN
2	EA	MAGNETIC HOLD- OPEN	SEM 7850	AL	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873-2Q	GRY	VON
1	EA	KEYSWITCH	653-04	630	SCE
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

DOORS MUST BE MANUFACTURED BY ALGOMA OR EGGERS TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE. NORMAL OPERATION IS BY CARD WHICH RETRACTS PANIC HARDWARE AND ENABLES ACTUATOR BUTTON ON SECURE SIDE. PUSHING NON-SECURE SIDE ACTUATOR BUTTON ALWAYS RETRACTS PANIC DEVICES AND POWERS DOORS OPEN. LEVER TRIM IS A CLASSROOM TYPE FUNCTION- LOCKED & UNLOCKED BY KEY ON OUTSIDE WHEN CARD READER SYSTEM MAY BE DOWN. CAN ALWAYS FREELY EXIT FROM INSIDE BY PUSHING PANIC BAR. POWER SUPPLY AND AUTO OPERATOR REQUIRE 110VAC AND N.C. FIRE ALARM CONNECTION. KEYSWITCH TURNS MAGNETIC HOLDERS ON/OFF.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 104

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	POWER TRANSFER	EPT-2	689	VON
2	EA	FIRE EXIT HARDWARE	QEL9827EO-F-LBR	626	VON
1	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
1	SET	DOOR EDGES	555	600	NGP
1	EA	AUTO. OPERATOR	9553 RF DOUBLE EGRESS	628	LCN
2	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873	GRY	VON
1	EA	POWER SUPPLY	PS873-2Q	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

DOORS MUST BE MANUFACTURED BY ALGOMA TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE.

EXIT ONLY PANIC DEVICES IN EACH DIRECTION. POWER SUPPLIES AND AUTO OPERATOR REQUIRE 110VAC AND N.C. FIRE ALARM CONNECTION. INSTALL DELAYED EGRESS MAGNETIC LOCK ON DOOR LEAF PUSHING TOWARD CORRIDOR. CARD READER CONTROLS DELAYED EGRESS MAGNETIC LOCK. WHEN CARD IS PRESENTED ON LOCKED SIDE, MAGNETIC LOCK TO RELEASE AND ALLOW PASSAGE THROUGH DOOR. CARD READER ALSO ENABLES ACTUATOR BUTTON ON LOCKED SIDE ALLOWING AUTO OPERATION OF DOORS WHEN DESIRED. PRESSING NON-LOCKING SIDE ACTUATOR BUTTON ALWAYS UNLOCKS MAGNETIC LOCK, RETRACTS PANIC HARDWARE AND AUTO OPENS DOORS.

## HW SET: 105

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	FIRE EXIT HARDWARE	9827EO-F-LBR	626	VON
1	SET	DOOR EDGES	555	600	NGP
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP

DOORS MUST BE MANUFACTURED BY ALGOMA TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE.

EXIT ONLY PANIC DEVICES IN EACH DIRECTION.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 106

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	SET	LEVER TRIM	L9010 03A LLL X LLL X LESS LOCK CASE	626	SCH
1	EA	ELECTRIC STRIKE	6211AL FSE 24VDC	630	VON
1	EA	PASSAGE LATCH	8525	626	ACC
1	EA	AUTO. OPERATOR	9542 RF	628	LCN
1	SET	SEALS	PROVIDED BY DOOR MANUFACTURER		
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

PASSAGE LATCH WITH ELECTRIC STRIKE FOR LATCH RELEASE- NO LOCK. DOOR WILL ONLY SWING A MAXIMUM OF 90 DEGREES WITH DOOR OPERATOR. PLAN SHOWS 180 DEGREES.

## HW SET: 107

6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT-2	689	VON
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	EU STOREROOM LOCK	L9080TEU 03A	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB1 OR MB2	689	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	CLOSER W/STOP & HO	4111 SHCUSH	689	LCN
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
2	EA	DOOR SWEEP	C627A	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.



# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 108

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	CLOSER W/STOP	4111 SCUSH	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	95WH	AL	NGP
1	EA	THRESHOLD	896V	AL	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 109

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	FIRE EXIT HARDWARE	9827EO-F-LBR	626	VON
1	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
1	SET	DOOR EDGES	555	600	NGP
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	MAGNETIC HOLD- OPEN	SEM 7850	AL	LCN
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
1	EA	POWER SUPPLY	PS873	GRY	VON
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

DOORS MUST BE MANUFACTURED BY ALGOMA TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE.

EXIT ONLY PANIC DEVICES IN EACH DIRECTION WITH DELAYED EGRESS IN ONE DIRECTION, CARD READER CONTROLLED. POWER SUPPLY REQUIRES 110VAC. DELAYED EGRESS LOCKS REQUIRE LOW VOLTAGE AND N.C. FIRE ALARM.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 110

8	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
2	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
2	EA	DUMMY TOUCH BAR	350	626	VON
2	EA	OFFSET DOOR PULL	8190-2-O	630	IVE
1	EA	AUTO. OPERATOR	9553 RF PUSH	628	LCN
2	EA	KICK PLATE	8400 12" X 1" LDW	630	IVE
2	EA	WALL STOP	WS407CVX	630	IVE
4	EA	SILENCER	SR64	GRY	IVE
1	EA	POWER SUPPLY	PS873	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	EA	MOTION SENSOR	SCAN II-W	WHT	SCE
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

DELAYED EGRESS ON PUSH SIDE WITH CARD READER OVERRIDE. MOTION SENSOR ON PP CR ICS CORRIDOR SIDE- POINT MOTION SENSOR DOWN ON OPENING SO DOORS DO NOT ACCIDENTALLY RELEASE.

POWER SUPPLY REQUIRES 110VAC. DELAYED EGRESS MAGNETIC LOCK REQUIRES LOW VOLTAGE, N.C. FIRE ALARM, MOTION SENSOR AND CARD READER INPUT.

## HW SET: 111

2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW4	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	EU STOREROOM LOCK	L9080TEU 03A	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP & HOLDER	WS45	626	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 112

6	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
2	EA	FIRE EXIT HARDWARE	9847EO-F-LBR	626	VON
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 12" X 1" LDW	630	IVE
2	EA	MAGNETIC HOLD- OPEN	SEM 7850	AL	LCN
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP

PANIC HARDWARE- FREE EGRESS BOTH DIRECTIONS BY PRESSING PANIC BAR.

## HW SET: 113

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. CARD READER UNLOCKS ELECTRIC STRIKE.

## SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 114

6	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT-2	689	VON
1	EA	FIRE EXIT HARDWARE	QEL9827EO-F-LBR	626	VON
1	EA	FIRE EXIT HARDWARE	QEL9827L-F-LBR 996L-03	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
2	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
1	SET	MEETING ASTRAGAL	600A	AL	NGP
1	EA	AUTO. OPERATOR	9553 RF PUSH	628	LCN
2	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873	GRY	VON
1	EA	POWER SUPPLY	PS873-2Q	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

NORMAL OPERATION IS BY CARD WHICH DISABLES DELAYED EGRESS, RETRACTS PANIC HARDWARE AND ENABLES ACTUATOR BUTTON ON SECURE SIDE. LEVER TRIM IS A CLASSROOM TYPE FUNCTION- LOCKED & UNLOCKED BY KEY ON OUTSIDE WHEN CARD READER SYSTEM MAY BE DOWN. POWER SUPPLIES AND AUTO OPERATOR REQUIRE 110VAC AND N.C. FIRE ALARM CONNECTION. DELAYED EGRESS MAGNETIC LOCKS REQUIRE LOW VOLTAGE POWER, CARD READER INPUT AND N.C. FIRE ALARM CONNECTION.

## HW SET: 115

6	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT-2	689	VON
1	EA	FIRE EXIT HARDWARE	QEL9827EO-F-LBR	626	VON
1	EA	FIRE EXIT HARDWARE	QEL9827L-F-LBR 996L-03	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	SET	MEETING ASTRAGAL	600A	AL	NGP
1	EA	AUTO. OPERATOR	9553 RF PUSH	628	LCN
2	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873-2Q	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

NORMAL OPERATION IS BY CARD WHICH RETRACTS PANIC HARDWARE AND ENABLES ACTUATOR BUTTON ON SECURE SIDE. PUSHING NON-SECURE SIDE ACTUATOR BUTTON ALWAYS RETRACTS PANIC DEVICES AND POWERS DOORS OPEN. LEVER TRIM IS A CLASSROOM TYPE FUNCTION- LOCKED & UNLOCKED BY KEY ON OUTSIDE WHEN CARD READER SYSTEM MAY

# SECTION 08 71 02 DOOR HARDWARE GROUPS

BE DOWN. CAN ALWAYS FREELY EXIT FROM INSIDE BY PUSHING PANIC BAR. POWER SUPPLY AND AUTO OPERATOR REQUIRE 110VAC AND N.C. FIRE ALARM CONNECTION.

## HW SET: 116

6	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9827EO-F-LBR	626	VON
1	EA	FIRE EXIT HARDWARE	9827L-F-LBR 996L-03	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	SET	MEETING ASTRAGAL	600A	AL	NGP
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

DOORS MUST BE MANUFACTURED BY ALGOMA OR EGGERS TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE. LEVER TRIM IS A CLASSROOM TYPE FUNCTION- LOCKED & UNLOCKED BY KEY ON OUTSIDE. CAN ALWAYS FREELY EXIT FROM INSIDE BY PUSHING PANIC BAR.

## HW SET: 117

6	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT-2	689	VON
1	EA	FIRE EXIT HARDWARE	9827EO-F-LBR	626	VON
1	EA	FIRE EXIT HARDWARE	9827L-F-LBR E996L-03	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	SET	MEETING ASTRAGAL	600A	AL	NGP
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	MAGNETIC HOLD- OPEN	SEM 7850	AL	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

DOORS MUST BE MANUFACTURED BY ALGOMA OR EGGERS TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE. LEVER TRIM IS A CLASSROOM TYPE FUNCTION- LOCKED & UNLOCKED BY KEY ON OUTSIDE OR ELECTRICALLY UNLOCKED BY CARD READER. CAN ALWAYS FREELY EXIT FROM INSIDE BY PUSHING PANIC BAR.

## SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 118

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	MORTISE CYLINDER	20-771T	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	AUTO. OPERATOR	9531 RF	628	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	KEYSWITCH	653-04	630	SCE
1	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
1	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

STOREROOM LOCKSET- ALWAYS TAKES A KEY TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE. KEYSWITCH ON CORRIDOR SIDE UNLOCKS AND POWERS DOOR OPEN. INSIDE PUSH BUTTON ALWAYS UNLOCKS ELECTRIC STRIKE AND POWERS DOOR OPEN. AUTO OPERATOR REQUIRES 110VAC AND N.C. FIRE ALARM CONNECTION.

## HW SET: 119

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT-2	689	VON
1	EA	FIRE EXIT HARDWARE	98L-F E996L-03-FS	626	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	RIM CYLINDER	20-757T	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 24VDC	630	VON
1	EA	AUTO. OPERATOR	9542 RF	628	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

STOREROOM TYPE FUNCTION- PUSH PANIC DEVICE BAR FOR DIRECTION OF EGRESS, LEVER ON PULL SIDE OF DOOR LOCKED/UNLOCKED BY KEY OR CARD READER. LEVER ON STAIRWELL SIDE TO UNLOCK ON FIRE ALARM ACTIVATION. POWER SUPPLY REQUIRES 110VAC AND N.C. FIRE ALARM CONNECTION (PROVIDE THE NECESSARY QUANTITY OF POWER SUPPLIES FOR EACH STAIRWELL.) AUTO OPERATOR REQUIRES 110VAC AND N.C. FIRE ALARM CONNECTION. CARD READER TO ENABLE WALL ACTUATOR ON STAIR SIDE.

# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 120

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	SET	LEVER TRIM	L9010 03A LLL X LLL X LESS LOCK CASE	626	SCH
1	EA	PASSAGE LATCH	8525	626	ACC
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	PROVIDED BY DOOR MANUFACTURER		

ROLLER LATCH NOT PERMITTED ON SMOKE DOOR- MUST HAVE POSITIVE LATCH. PASSAGE LEVER SET SPECIFIED.

## HW SET: 121

6	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
2	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
2	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	AUTO. OPERATOR	9553 RF DOUBLE EGRESS	628	LCN
2	EA	WALL STOP	WS407CVX	630	IVE
4	EA	SILENCER	SR64	GRY	IVE
1	EA	POWER SUPPLY	PS873	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

PUSH PLATES EACH DIRECTION- NO LOCKING. AUTO OPERATOR REQUIRES 110VAC. DELAYED EGRESS MAGNETIC LOCKS REQUIRE LOW VOLTAGE, CARD READER AND N.C. FIRE ALARM INPUT.

## HW SET: 122

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	POWER TRANSFER	EPT-2	689	VON
2	EA	FIRE EXIT HARDWARE	QEL9827EO-F-LBR	626	VON
2	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
1	SET	DOOR EDGES	555	600	NGP
1	EA	AUTO. OPERATOR	9553 RF DOUBLE EGRESS	628	LCN
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873	GRY	VON
1	EA	POWER SUPPLY	PS873-2Q	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

DOORS MUST BE MANUFACTURED BY ALGOMA TO ACHIEVE REQUIRED FIRE RATING WITH SPECIFIED HARDWARE.

EXIT ONLY PANIC DEVICES IN EACH DIRECTION. POWER SUPPLIES AND AUTO OPERATOR

# SECTION 08 71 02 DOOR HARDWARE GROUPS

REQUIRE 110VAC AND N.C. FIRE ALARM CONNECTION. INSTALL DELAYED EGRESS MAGNETIC LOCK ON BOTH DOOR LEAVES. CARD READERS CONTROL DELAYED EGRESS MAGNETIC LOCK. WHEN CARD IS PRESENTED ON LOCKED SIDE, MAGNETIC LOCK TO RELEASE AND ALLOW PASSAGE THROUGH DOOR. CARD READER ALSO ENABLES ACTUATOR BUTTON ON LOCKED SIDE ALLOWING AUTO OPERATION OF DOORS WHEN DESIRED.

## HW SET: 123

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	POWER TRANSFER	EPT-2	689	VON
2	EA	FIRE EXIT HARDWARE	QEL9827EO-F-LBR	626	VON
1	SET	DOOR EDGES	555	600	NGP
1	EA	AUTO. OPERATOR	9553 RF DOUBLE EGRESS	628	LCN
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP
1	EA	PS873 OPTION BOARD	873-FA		VON
1	EA	POWER SUPPLY	PS873-2Q	GRY	VON
2	EA	ACTUATOR, WALL MOUNT	8310-856		LCN
2	EA	ESCUTCHEON	8310-874	630	LCN
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

EXIT ONLY PANIC DEVICES IN EACH DIRECTION. POWER SUPPLIES AND AUTO OPERATOR REQUIRE 110VAC AND N.C. FIRE ALARM CONNECTION. PRESSING ACTUATOR BUTTONS ALWAYS RETRACTS PANIC HARDWARE AND AUTO OPENS DOORS.

## HW SET: 124

6	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 6" X 16"	630	IVE
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	WALL STOP & HOLDER	WS45	626	IVE
4	EA	SILENCER	SR64	GRY	IVE

PUSH EACH DIRECTION- NO LATCH, NO LOCK.

## HW SET: 125

6	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
2	EA	ELECTROMAG LOCK	390DEL-DSM-MBS-SEC	628	SCE
2	EA	PUSH PLATE	8200 6" X 16"	630	IVE
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	WALL STOP	WS407CVX	630	IVE
4	EA	SILENCER	SR64	GRY	IVE
1	EA	POWER SUPPLY	PS873	GRY	VON
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		

PUSH PLATES EACH DIRECTION- NO LOCKING. DELAYED EGRESS MAGNETIC LOCKS REQUIRE LOW VOLTAGE, CARD READER AND N.C. FIRE ALARM INPUT.



# SECTION 08 71 02 DOOR HARDWARE GROUPS

## HW SET: 126

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 127

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 03A	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE 24VDC	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	CARD READER	PROVIDED BY SECURITY SECTION		
1	EA	POWER SUPPLY	PROVIDED BY SECURITY SECTION		

STOREROOM LOCKSET- ALWAYS TAKES A KEY OR CARD TO ENTER, CAN ALWAYS FREELY EXIT FROM INSIDE.

## HW SET: 128

2	SET	PIVOT SET	7230F	630	IVE
1	SET	AUTO FLUSH BOLT	FB41P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	OFFICE LOCK	L9050T 03A L583-363 XL11-515	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
1	EA	ASTRAGAL	PROVIDED BY DOOR MANUFACTURER	600	
2	EA	DELAYED CLOSER	4011 DEL	689	LCN
1	EA	WALL STOP	WS407CVX	630	IVE
1	SET	SEALS	5050B (HEAD, JAMBS & ASTRAGAL)	BRN	NGP

OFFICE LOCKSET- LOCKED AND UNLOCKED BY KEY ON OUTSIDE. THUMBTURN INSIDE LOCKS OUTSIDE LEVER FOR PRIVACY. CAN ALWAYS FREELY EXIT FROM INSIDE. LEAD LINE ALL DOOR PENETRATIONS.

END OF SECTION



## SECTION 08 71 13 AUTOMATIC DOOR OPERATORS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide automatic door operators in accordance with Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 31 13 - PROJECT COORDINATION.
- C. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data, templates, diagrams.
- D. Section 08 71 00 - DOOR HARDWARE: Keyed Switching.
- E. Divisions 26 - ELECTRICAL: Local smoke detectors and fire alarm wiring to contacts in operator housing.
- F. Divisions 26 - ELECTRICAL: 120 VAC Emergency power wiring to automatic door.
- G. Divisions 26 - ELECTRICAL: Conduit and backboxes for remote operating controls.

#### 1.3 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI / BHMA A156.10, Power Operated Pedestrian Doors.
- B. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.

#### 1.4 QUALITY ASSURANCE

- A. Codes and Standards: Unless otherwise noted, comply with the following Standards.
  - 1. ANSI A156.10.
  - 2. Washington Regulations for Barrier Free Facilities, Section 1106.10.5.
- B. Installer's Qualifications: Engage an Installer who is an authorized representative of the automatic door operator manufacturer for both installation and maintenance.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Manufacturer's Data: Submit manufacturer's Specifications and standard details for automatic door operators, accessories and other components of the Work. Include roughing-in details, wiring diagrams of all associated hardware, and operating instructions.
- C. Templates and Diagrams: Furnish wiring diagrams and other data to fabricators and installers of related Work, as needed for coordination of automatic door and operator installation.

#### 1.6 MAINTENANCE SERVICE

- A. Provide regular maintenance service on each automatic door for a period of three (3) months after the date of Substantial Completion. The maintenance service shall include regular monthly examinations of the installation as well as emergency call back service during regular hours by competent and trained employees and shall include all necessary service, supplies and parts to keep the equipment in good operable condition. Repair of damage as the result of misuse, accidents or negligence being excluded. At the end of the regular Maintenance Period, the Owner shall have the option of entering into a regular maintenance contract with the manufacturer's service representative.

#### 1.7 PRODUCT HANDLING

- A. Do not deliver materials to Project Site until the Work is ready for the installation of automatic entrances.

#### 1.8 WARRANTY

- A. Provide manufacturer's standard one (1) year warranty on automatic swing operators.

### PART 2 - PRODUCTS

## SECTION 08 71 13 AUTOMATIC DOOR OPERATORS

### 2.1 MATERIALS

- A. Aluminum Extrusions: Manufacturer's standard.
  - 1. Clear anodized finish: Provide automatic swing operator housings with manufacturer's standard finish.

### 2.2 AUTOMATIC SWING DOOR OPERATORS

- A. Acceptable Manufacturers:
  - 1. Horton Automatics.
  - 2. Nabco Entrances, Inc.
  - 3. No Substitutions.
- B. Type: Nabco GT 400, Horton 4000 operator, UL listed for fire exit hardware. Provide operators with interfaces and extra contacts to provide the operating functions as described below:
  - 1. For doors indicated to be remotely controlled by the Automated Guided Vehicle System (AGVS), in addition to the user actuation specified. Provide a separate set of relay dry contacts for remote control operation as follows:
    - a. The AGV system interacts with an automatic door when an AGV is required to pass through it. The interaction consists of the AGV system signaling the door to open. The door will open and signal the AGV system when the door is fully open. The automatic door will remain open as long as the AGV signal is maintained. The signal to open the door from the AGV system will be a relay dry contact output. If a door open signal is not available, limit switches need to be added to indicate when the door is fully open.
    - b. AGV control of the automatic door is similar to user control. The user touches a wall switch to open the door; when the user sees the door is open, the user passes through. The door automatically closes after a short time delay. The AGV system signals the door to open by closing a control relay contact (parallel to the user input). The door controller signals when the door is fully open and allows the AGV to pass through. After the AGV clears the doorway, the AGV system will release the door open signal. The automatic door will then close after a short time delay. Users and the AGV system can both control the same automatic doors in their own fashion.
  - 2. Keyed low-voltage switches will cut power to power units and transformers serving shear locks and electric strikes. Provide relays to simultaneously cut power to door operators.
- C. Capacity: Provide operators of the size recommended by manufacturer for the door size, weight, movement and condition of exposure, for operation under normal traffic load for the type of occupancy indicated.
- D. Exposed Housing for Swinging Door Operators: Extruded aluminum 0.146 inch minimum thickness, with provisions for maintenance access, with end caps. Length to match door openings. Provide full length operator housing on one side of door for double egress doors.
- E. Adjustment Features: Provide operators with fully adjustable opening speeds, closing speeds and checking speeds. Provide for panic bar operation of fire doors when power is off.
- F. Presence Detectors: Manufacturer's standard units. Provide one for each door leaf on swing side mounted on head of door frame. Each sensor shall provide a detection area as follows:
  - 1. The minimum width shall be a pattern that covers the door opening with no more than 5 inches without a detection pattern from either side of the door opening.
  - 2. The minimum length of the pattern shall be no more than 5 inches from the face of the door to at least 5 inches beyond the leading edge of the door when it is in the open position, when measured from the center of the door opening.

## SECTION 08 71 13 AUTOMATIC DOOR OPERATORS

- G. Actuating Devices:
  - 1. Push plate controls: Manufacturer's standard round or square stainless steel or aluminum push plate with the words "Push to Open" engraved in the face, which will mount on a standard 4-1/2" x 4-1/2" electrical box.
  - 2. Touchless wall switch: Manufacturer's "No-Touch" wall switch, 24 volt, infra-red pulsing energy operating in a reflective mode. Recessed with flat face plate. Powered by transformer located in operator housing. Unit shall have adjustable door hold open range from 0 to 15 inches and adjustable door hold open range from 1 to 80 seconds.
- H. Operation:
  - 1. **[Insert description]**

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install automatic door operators in accordance with reviewed Shop Drawings and wiring diagrams and manufacturer's installation instructions. At time of Substantial Completion, readjust door operators for optimum operating condition and safety. Lubricate moving parts as required and clean exposed surfaces.

#### 3.2 POST-OCCUPANCY SERVICES

- A. Include in the cost of the Work, post-occupancy adjustments for setting door closing times to User's satisfaction. Assume the adjustments will be completed on same day.

END OF SECTION



## SECTION 08 80 00 GLAZING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Replacement insulated glass units at all exterior aluminum windows on eighth floor.
- B. Privacy insulated glass units at exterior aluminum windows in Patient Toilet Rooms.
- C. Laminated privacy glass at interior relights and sliding aluminum-framed glass doors in Patient Toilet Rooms.
- D. Glazing at interior relites.
- E. Mirror glass not specified elsewhere.
- F. Safety glass vision lites at interior doors.
- G. Glass shelving not specified elsewhere.
- H. Glass doors for display cabinets.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of samples.
- C. Section 02 41 19 - SELECTIVE DEMOLITION: Removal of insulated glass units from existing window wall system on the eighth floor.
- D. Section 06 40 00- ARCHITECTURAL WOODWORK: Display cabinet to receive glass doors and shelves.
- E. Section 08 06 00 - DOOR SCHEDULE: Doors to receive vision lites.
- F. Section 08 11 13 - STEEL DOORS & FRAMES: Relite frames.
- G. Section 08 32 14 - SLIDING ALUMINUM-FRAMED GLASS DOORS: Doors to receive laminated privacy glass.
- H. Section 08 51 00 - ALUMINUM WINDOW WALLS: Re-installation of vertical mullions, elastomeric glazing gaskets, installation of interior window stool extenders.
- I. Section 08 51 14 - INTERIOR ALUMINUM RELITES: Interior relites to receive glazing.
- J. Section 10 28 00 - TOILET ACCESSORIES: Metal-framed mirrors.
- K. Section 13 49 00 - RADIATION PROTECTION: for radiation shielding requirements for

#### 1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA 800, Voluntary Specifications and Test Methods for Sealants.
- B. ASTM International (ASTM):
  - 1. ASTM C1036, Standard Specification for Flat Glass
  - 2. ASTM C1048, Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass
  - 3. ASTM C1087: Standard Test Method for Determining Compatibility of Liquid-Applied Sealants With Accessories Used in Glazing Systems
  - 4. ASTM C1503, Standard Specification for Silvered Flat Glass Mirror
  - 5. ASTM C1172, Standard Specification for Laminated Architectural Flat Glass
  - 6. ASTM C1281, Standard Specification for Preformed Tape Sealants for Glazing Applications
  - 7. ASTM E774, Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units
- C. Code of Federal Regulations (CFR):
  - 1. 16 CFR 1201, Safety Standard for Architectural Glazing Materials
- D. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.

#### 1.4 QUALITY ASSURANCE

- A. Standards: Except as modified by governing Codes and by the Contract Documents, comply with applicable provisions and recommendations of the Codes and Standards listed under Article 1.3 of this Section.
- B. Structural Silicone Sealant Adhesion and Compatibility Testing: Submit to sealant manufacturer, for testing indicated below, samples of each glazing material type, tape

## SECTION 08 80 00 GLAZING

sealant, gasket, glazing accessory and glass-framing member that will contact or affect structural silicone glazing sealants:

1. Use ASTM C1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets and glazing channel substrates.
2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
5. Testing will not be required if elastomeric glazing sealant manufacturer submits data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

### 1.5 REGULATORY REQUIREMENTS

- A. Requirements of Regulatory Agencies: Work herein shall comply with IBC Chapter 24, Glass and Glazing. If any portion of these Specifications are in conflict with the referenced Code, notify Architect immediately.

### 1.6 SUBMITTALS

- A. Submittal under the provisions of Section 01 33 00.
- B. Samples: Provide 12 x 12 inches samples of each type of tinted and coated glass.
  1. Ceramic frit glass samples: Submit 12 x 12 inches samples of glass of each color and type of silk screened ceramic frit.
- C. Mirror Mastic Compatibility Test Report: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing.
- D. Test data for use of privacy insulated glass units privacy laminated glass in wet applications.

### 1.7 PRODUCT HANDLING

- A. Deliver, store and handle glass in accordance with the manufacturer's recommendations, protected from weather, staining and damage. During storage and handling of glass provide cushions at edges to prevent impact damage. Protect glass from scratches and abrasion.
- B. Label each glass lite in accordance with IBC Section 2403. Provide etched or ceramic-fired identification on tempered glass.

### 1.8 PROJECT / SITE CONDITIONS

- A. Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by the glazing material manufacturer, or when joint substrates are wet due to rain, frost, condensation or other causes.

### 1.9 WARRANTY

- A. Insulating Glass in Vertical Application: Submit a 10-year installer warranty against material obstruction of vision as a result of dust or film formation on the internal glass surfaces as a result of the failure of the hermetic seal.
  1. Upon notification of such defects, within the Warranty Period, make necessary replacements at convenience of the Owner.
- B. Mirrors: Submit manufacturer's standard warranty against any evidence of silver spoilage.
  1. Upon notification of such defects, within the Warranty Period, make necessary replacements at convenience of the Owner.
- C. Sealant: Provide manufacturer's standard 20-year limited warranty on structural silicone joint sealing, structural adhesion and anti-staining.

## PART 2 - PRODUCTS



## SECTION 08 80 00 GLAZING

### 2.1 GLASS

- A. General: Glass shall meet requirement of ASTM C1036 unless otherwise specified. Type and thickness as shown or specified.
- B. Clear Float Glass: Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select).
- C. Tinted Float Glass: Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select), and as follows:
  - 1. Manufacturer's standard tint as scheduled at end of this Section.
- D. Fire-Rated Glazing Material: Proprietary Category II safety glazing product in the form of two lites of clear ceramic glazing material laminated together to produce a laminated lite of 5/16 inch (8mm) nominal thickness; polished on both surfaces:
  - 1. Fire-protection rating: As indicated for the assembly in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - 2. Polished on both surfaces, transparent.
  - 3. Product: "FireLite Plus" by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.
- E. Mirror Glass: ASTM C1503, Mirror Select Quality, 6mm thick.
- F. Glass Shelving: ASTM C1048, 3/8" thick, clear, Kind FT (fully tempered), Type 1, polished edges.
- G. Glass Doors: ASTM C1048, 1/2-inch thick, clear, Kind FT (fully tempered), Type 1, polished edges. Pre-drill for door hardware.
- H. Heat Treated Glass:
  - 1. Full tempered glass: Comply with ASTM C1048: Strengthen to increase the flexural strength to not less than four times the strength of annealed glass. Wherever possible, locate tong marks along an edge which will be concealed in the glazing system.
  - 2. Heat strengthened glass: Comply with ASTM C1048: Strengthen by manufacturer's standard heat-treatment process, to increase the flexural strength to not less than two times the strength of annealed glass.
- I. Insulating Glass Units: The quality of glass as used in insulating glass units shall be as specified for single glazing.
  - 1. Insulating-glass units, general: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E774 for Glass CBA units.
  - 2. Fabrication: Fabricate units at factory with sheets of glass hermetically sealed at all edges.
- J. Insulated Glass Types: As scheduled at end of this Section.
  - 1. Type G-01 Performance:
    - a. Visible light transmittance: 54 percent.
    - b. Winter U value: 0.29 Btu/ft<sup>2</sup>/hr/°F.
    - c. Reflectance: 13 percent.
    - d. Shading coefficient: 0.32.
  - 2. Type G-07 Performance:
    - a. Visible light transmittance: 68 percent.
    - b. Winter U value: 0.29 Btu/ft<sup>2</sup>/hr/°F.
    - c. Reflectance: 11 percent.
    - d. Shading coefficient: 0.43.
- K. Laminated Privacy Glass: 7/32 inch, ASTM C1172, and complying with other requirements specified and with the following:
  - 1. Interlayer: White 0.030 inch polyvinyl butyral with a proven record of no tendency to bubble, discolor or lose physical and mechanical properties after laminating glass lites and installation.
    - a. Laminate lites in autoclave with heat plus pressure.
  - 2. Laminating process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets.
- L. Security Glazing:
  - 1. UL listed Level III bullet-resistant, 4-ply polycarbonate.
  - 2. Thickness: 1-1/4 inches (32 mm).

## SECTION 08 80 00 GLAZING

3. Weight: 8 lbs/sq. ft. (39 Kg/sq. m).
4. Color: Clear.
5. Acceptable Manufacturers:
  - a. TP 300 by Armortex, [www.armortex.com](http://www.armortex.com).
  - b. Makrolon Hygard BR 1250 by Pacific BulletProof Co., [www.pacificbulletproof.com](http://www.pacificbulletproof.com).
  - c. LP 1250 by Protective Armored Systems, Inc., [www.pasarmored.com](http://www.pasarmored.com).
  - d. Approved alternate.
- M. Architectural Glazing:
  1. Full tempered clear glass. Thickness as scheduled.
  2. Approved Manufacturer: Matelux by AGC Flat Glass North America, [www.afgglass.com](http://www.afgglass.com).
  3. Frosted: Acid etched one side.
  4. Custom Patterned Film: As scheduled in Section 09 06 10.
- N. Electrified Privacy Glazing:
  1. Full tempered clear laminated glass. Thickness as indicated.
  2. Electrical Requirements: 110 volt, with 100V AV power switch control units.
  3. Approved Manufacturer: SwitchLite Privacy Glass, [www.switchlite.com](http://www.switchlite.com).
- O. Radiation-Resistant Glazing:
  1. Meet radiation protection recommendations prepared by Owner's physicist in Final Radiation Shielding Report prepared for specific equipment selected by Owner. See Section 13 49 00.
  2. Meet lead equivalent protection of partition.

### 2.2 ACCESSORY MATERIALS

- A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- B. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- C. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- D. Glazing Tapes: Preformed butyl-based elastomeric tape with a solids content of 100 percent; non-staining and non-migrating in contact with non-porous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
  1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- E. Structural Silicone Sealant: Dow Corning 795. No substitution.
  1. Color: To match that of existing aluminum window wall system.
- F. Glazing Sealants for Fire-Resistive Ceramic Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.
- G. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
- H. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.
- I. Bottom Trim for Frameless Mirrors: Clean anodized aluminum "J" track, A. Geo. Diack No. 636 or equivalent.
- J. Sealed Microblind Assembly: Provide sealed integral blind system as manufactured by Pariluse LLC, [www.ieblinds.com](http://www.ieblinds.com).
  1. Door Vision Lites:
    - a. Type: 5/8-inch microblinds. Provide hold down brackets.
    - b. Controls: Slim line knobs, black.
    - c. Frames: Model SL-1S, through-bolted metal frame
  2. Relites:

## SECTION 08 80 00 GLAZING

- a. Type: 1-inch miniblinds.
- b. Controls: Angled control knobs, white.
- c. Frames: Furnished under Section 08 11 13.
- K. Glazing Felt: Treated wool felt, adhesive backed, non-wicking, non-staining.
- L. Patterned Film: Custom film for application to glass product as architectural decorative glazing. As scheduled in Section 09 06 10.

### 2.3 FABRICATION

- A. Cutting: Obtain sizes from approved Shop Drawings or by field measurement. Cut glass to fit each opening with minimum edge clearances and bite on glass as recommended by glass manufacturer. Do not nip glass edges. Edges may be wheel cut or sawed and seamed at manufacturer's option. All glass shall have clean-cut edges. Do not cut, seam, nip or abrade glass after heat treating.
- B. Mirrors: All edges shall be smooth, seamed and edge sealed.
- C. Glass Doors:
  - 1. Locate and provide holes and cutouts in glass to receive hardware before tempering glass.
  - 2. Do not permit cutting, drilling or other alterations to glass after tempering.
  - 3. Fabricate Work to accommodate required fittings, hardware, anchors, reinforcement, and necessary items.

### 2.4 PRE-FABRICATION

- A. Glass Doors and Entrances: Complete fabrication, assembly, finishing, hardware application and other work to greatest extent possible at factory before shipment to Project Site. Disassemble components only as necessary for shipment and installation.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine glazing framing, with installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness and offsets at corners.
  - 2. Presence and functioning of weep system.
  - 3. Minimum required face or edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing Standards.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project Site and legally dispose of off Project Site.
  - 1. 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 sealant-substrate testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- 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 as follows:

## SECTION 08 80 00 GLAZING

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  2. Provide 1/8 inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing Standards.
- I. Set glass lites in each series with uniform pattern, draw, bow and similar characteristics.
- J. Installation of each light of exterior glass shall be watertight and airtight, and capable of withstanding temperature changes, wind loading and impact from operation (doors and operable sash), without failure of any kind including loss or breakage of glass, failure of seal and excessive deterioration of glazing materials.

### 3.4 TAPE GLAZING (INTERIOR)

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or recessed slightly below sight-line of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

### 3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces to sealant to provide a substantial wash away from glass.

### 3.7 STRUCTURAL SEALANT APPLICATION

- A. Before applying the structural silicone sealant, use pressure-sensitive tape to mask the exterior face of the joint. Start from the top down and overlap the runs.

## SECTION 08 80 00 GLAZING

- B. Use drop cloths to cover any horizontal surfaces likely to receive any excess sealant removed during tooling operations.
- C. Apply the sealant carefully, pushing the bead ahead of the nozzle and making sure that the entire cavity is filled. Air pockets or voids along the edges are not acceptable.
- D. Utilize reusable twist-in temporary glass retainers to support the glass until the structural silicone has fully cured in accordance with silicone manufacturer's recommendations.
- E. Immediately tool the joint after application, before skin begins to form on the surface. Tooling should be done neatly, forcing the sealant into contact with the sides of the joint.
- F. Eliminate any internal voids and assure good substrate contact.

### 3.8 ADHESIVE MOUNTING OF MIRRORS

- A. Support mirror in continuous glazing track. Apply mirror mastic in accordance with mastic manufacturer's instructions. Do not cover more than 25 percent of mirror back. Apply mirror to substrate so that areas not covered with mastic will remain open for ventilation, with 1/8 inch minimum clearance from substrate. Provide temporary rigid support until adhesive has set.

### 3.9 CLEANING & PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove non-permanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents and vandalism, during Construction Period.

SCHEDULE OF GLAZING		
Tag	Type	Description
G-01	Thermal Clear Exterior Glazing  Insulated Glass Unit	Manufacturer: Guardian Industries Product: 1-inch Insulating HS/HS. 1/4-inch (6 mm) clear HS with SunGuard SuperNeutral 54 coating on #2 surface. 1/2-inch air space. 1/4-inch (6 mm) clear HS.
G-02	Thermal Fritted Exterior Glazing Insulated Glass Unit	Manufacturer: Oldcastle Glass Product: 1-inch Insulating HS/HS. 1/4-inch (6 mm) clear HS with white silk-screened pattern on #2 surface, 40% coverage. 1/2-inch air space. 1/4-inch (6 mm) clear HS with Low-E coating on #3 surface.
G-03	Exterior Spandrel Exterior Glazing Insulated Glass Unit	Manufacturer: Oldcastle Glass Product: 1-inch Insulating Spandrel HS/HS. 1/4-inch (6 mm) clear HS with white silk-screened pattern on #2 surface, 40% coverage. 1/2-inch air space. 1/4-inch (6 mm) clear HS with Spandrel coating on No. 4 Surface.
G-04	Thermal Clear Safety Exterior Glazing Insulated Glass Unit	Manufacturer: Guardian Industries Product: 1-inch Insulating HS/FT. 1/4-inch (6 mm) clear HS with SunGuard SuperNeutral

## SECTION 08 80 00 GLAZING

		54 coating on #2 surface. 1/2-inch air space. 1/4-inch (6 mm) clear FT
G-05	Thermal Clear Fritted Safety Exterior Glazing Insulated Glass Unit	Manufacturer: Guardian Industries Product: 1-inch Insulating HS/FT. 1/4-inch (6 mm) clear HS with white silk-screened pattern on #2 surface, 40% opacity. 1/2-inch air space. 1/4-inch (6 mm) clear FT
G-06	Thermal Clear Safety Exterior Glazing Insulated Glass Unit	Manufacturer: Guardian Industries Product: 1-inch Insulating FT/FT. 1/4-inch (6 mm) clear FT with SunGuard SuperNeutral 54 coating on #2 surface. 1/2-inch air space. 1/4-inch (6 mm) clear FT.
G-07	Thermal Clear Exterior Glazing  Insulated Glass Unit	Manufacturer: Guardian Industries Product: 1-inch Insulating HS/HS. 1/4-inch (6 mm) clear HS with SunGuard SuperNeutral 68 coating on #2 surface. 1/2-inch air space. 1/4-inch (6 mm) clear HS.
G-08	Not Used	
G-09	Not Used	
G-10	Interior Security Glazing	Product: Bullet-Resistant Polycarbonate As specified in Paragraph 2.1 L of this Section.
G-11	Interior Privacy Glazing	Manufacturer: Pariluse Product: 1-inch sealed microblind assembly as specified in Paragraph 2.1 J of this Section.
G-12	Interior Vision Glazing	Manufacturer: Contractor's choice. Product: 1/4-inch (6 mm) clear FT
G-13	Interior Architectural Glazing	Manufacturer: Matelux. Product: 1/2-inch (12 mm) clear FT with custom patterned film as scheduled in Section 09 06 10.
G-14	Interior Privacy Glazing	Manufacturer: Matelux. Product: 1/4-inch (6 mm) frosted FT.
G-15	Interior Privacy Glazing	Manufacturer: Matelux. Product: 1/2-inch (12 mm) frosted FT
G-16	Interior Architectural Glazing	Manufacturer: Matelux. Product: 1/4-inch (6 mm) clear FT with custom patterned film as scheduled in Section 09 06 10.
RRG-01	Interior Radiation- Resistant Glazing	Manufacturer: Product: clear FT, thickness as required.
RRG-02	Interior Radiation- Resistant Privacy Glazing	Manufacturer: Product: 2 glass panels FT/FT in radiation-shielded steel frame. RRG-01, thickness as required clear FT. Air space. 1/4-inch (6 mm) electrified privacy glass FT.

END OF SECTION

## SECTION 08 91 19 LOUVERS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Aluminum louvers connected to ductwork.
- B. Aluminum louvers not connected to ductwork.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 04 22 00 - CONCRETE UNIT MASONRY: Masonry openings to receive louvers.
- D. Section 07 42 43 - COMPOSITE WALL PANELS: Openings to receive louvers and finish.
- E. Section 07 62 00 - SHEET METAL FLASHINGS & TRIM: for flashing not specified elsewhere.
- F. Section 07 92 00 - JOINT SEALANTS: for sealants.
- G. Division 23 - HEATING, VENTILATING, AIR CONDITIONING: Support Furring on Mechanical Unit.

#### 1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA Document 2604, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels..
- B. Air Movement and Control Association International (AMCA):
  - 1. ANSI/AMCA Standard 500

#### 1.4 QUALITY ASSURANCE

- A. Acceptable Manufacturers: Basis of Design is Airolite louvers. All other manufacturers of similar products and profiles may obtain approval per Section 01 60 00. Substitution Request submittal shall include free area calculations, rain water penetration and details.
  - 1. Manufacturer shall submit performance data derived in accordance with ANSI/AMCA Standard 500 on a 4' x 4' unit demonstrating that it provides a minimum of 8.07 square feet of free area and shall intake 840 FPM free area velocity at a static pressure drop not exceeding 1.13 inch H<sub>2</sub>O per ANSI/ AMCA Standard 500. Water penetration shall not exceed 0.01 ounces of water per square foot of free area at a velocity of 1040 FPM when tested for 15 minutes per ANSI/AMCA Standard 500.
- B. Louvers shall be fabricated full height in one piece to be supported entirely from jambs.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Include plans, elevations, sections, and details showing profiles, angles, spacing of louver blades; unit dimensions related to wall openings and construction; free areas for each size indicated; and profiles of frames at jambs, heads and sills. Indicate anchorage.
- C. Samples of Finish Coordination: Submit four (4) 3" x 5" samples of actual finish on aluminum to verify compliance.

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Check actual louver openings by accurate field measurements before fabrication; show recorded measurements on final Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delay of the Work.
  - 1. Where openings are not ready for measuring without delaying the Work, guarantee opening dimensions and proceed with fabrication of louvers without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to guaranteed dimensions.

## SECTION 08 91 19 LOUVERS

### 1.7 SPECIAL WARRANTY

- A. Warrant louvers to be weatherproof for 2 years.

## PART 2 - PRODUCTS

### 2.1 APPROVED MANUFACTURERS

- A. Airolite. [www.airolite.com](http://www.airolite.com).
- B. C/S Group. [www.c-sgroup/louvers.com](http://www.c-sgroup/louvers.com).
- C. Ruskin Air & Sound Control. [www.ruskin.com](http://www.ruskin.com).
- D. Approved Substitutions.

### 2.2 LOUVERS (Basis of Design)

- A. Type L-1
  - 1. Model: CB666 by Airolite..
  - 2. Type: Drainable.
  - 3. Location: Mechanical intake and exhaust ducts and other locations as indicated.
- B. Continuous stationary blades with concealed vertical mullions.
- C. Size and Shape: As indicated on Drawings.
- D. Minimum Net Free Area: 50 percent.
- E. Material: Aluminum, finish to match composite wall panels.

### 2.3 REQUIRED LOUVER ACCESSORIES:

- A. Bird Screen: Material to match louver. Mesh opening size: 1/2-inch.
  - 1. Where required: Provide over interior face of louver where supplying outside air to ventilation system ductwork.

### 2.4 ANCHORAGE

- A. Provide anchorage of jambs and vertical mullions to steel support framing.
  - 1. Provide isolators between aluminum and steel.
  - 2. Fasteners: Steel self-drilling screws with hardened tips and organic polymer coating. All fasteners shall be non-corrosive.
  - 3. Shims: Plastic or galvanized steel with isolators. Wood shims shall not be allowed.
- B. Blank-off Panels: Material to match louver.

### 2.5 FINISH

- A. Two-coat thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2604, except humidity resistance and water resistance shall be 1,000 hours.
  - 1. Color: Custom finish as selected by Architect.

### 2.6 ACCESSORIES

- A. Corrosion Insulating Compound: Aliphaltic coating compound, Fed. Spec. TT-C-494, Type II.
- B. Fasteners & Accessories: Stainless steel. Provide all required.
- C. Protective Coating: Contractor's choice, easily removable. Provide where necessary to protect exposed metal against damage.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install louver units plumb, level, and in proper alignment with adjacent Work. Anchor louvers securely with no visible fasteners on exterior side unless specifically shown.
- B. Coat dissimilar metals that are in contact with Corrosion Insulating Compound, 7-1/2 mils minimum dry film thickness, applied to each contacting face.
- C. Set flanges and flashings in bed of sealant as specified under Section 07 92 00.



## SECTION 08 91 19 LOUVERS

D. Provide water-tight seal between louvers and any connecting ductwork.

### 3.2 PROTECTION & CLEANING

A. Clean and touch-up minor abrasions in finishes with air-dried coating that match color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION



## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION			FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name		Material	Base	North	East	South	West		Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish		
1st Floor																	
1000	Sanitary Sump		GBJ														
1001	Parking		GBJ														
1002	Storm Sump		GBJ														
1003	Elev. Mach.		GBJ														
1004	Stor.		GBJ														
	elev.21		GBJ														
	elev.22		GBJ														
S2-1	Stair		GBJ														
1005	Elev. Lobby		GBJ														
1006	Fountain Pump		GBJ														
1011	Staff Lounge		VT-1	RB-1	P-3/P-4	P-3/P-4	P-3/P-4	P-3/P-4		PL-1	PL-1	SS-3	PL-3			5,6,10,11,23	
1011A	Staff Lockers		VT-1	RB-1	P-1	P-1	P-1	P-1		PL-1	PL-1					10,11	
1012	Pat. T.		SV-2	SC	EP-1	EP-1	EP-1	EP-3								4	
1013	Staff T.		SV-2	SC	EP-1	EP-1	EP-1	EP-3								4	
1014	Corridor		VWF-1	RB-1	P-1	P-1	P-1	P-1									
1015	Pat. T.		SV-2	SC	EP-1	EP-1	EP-1	EP-3								4	
1016	Equip./Stor.		SV-2	RB-1	P-1	P-1	P-1	P-1									
1017	Shelled Stor.		?		P-1	P-1	P-1	P-1									
1022	Corridor		VWF-1/2	RB-1	P-1	P-1	P-1	P-1								29	
1023	Corridor		SV-1	RB-1	P-1	P-1	P-1	P-1									
1024	H.C. Dr.		CPT-1	RB-1	P-1	P-4	P-1	P-1		PL-1	PL-1					23,24	
1025	H.C. Dr.		CPT-1	RB-1	P-1	P-4	P-1	P-1		PL-1	PL-1					23,24	
1026	Sub-Wait		CPT-1	RB-1		VWC-2	VWC-2	VWC-2								27	
1027	Cont.		SV-1	RB-1	P-1	P-1	P-1	P-1		PL-1	PL-1	PL-2	PL-3				
1028	Rt.-3		SV-1	RB-1	P-1	P-1	P-1	P-1		PL-1	PL-1	SS-3	PL-3			5,6	
1029	Office		CPT-2	RB-1	P-1	P-1	P-1	P-1		PL-1	PL-1	PL-2	PL-3			10	
1030	Stor.		CPT-1	RB-1	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1									
1031	Office		CPT-2	RB-1	P-1	P-1	P-1	P-1		PL-1	PL-1	PL-2	PL-3			10	
1032	Hall		VWF-1	RB-1	P-1	P-1	P-1	WP-1/P-1									

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
1032A	Alcove	VWF-1	RB-1	WP-1/P-1	WP-1/P-1	WP-1/P-1										
1032B	Alcove	VWF-1	RB-1	WP-1/P-1	WP-1/P-1	WP-1/P-1				PL-1	PL-1					
1033	Staff T.	SV-2	SC	EP-1	EP-3	EP-1	EP-1								4	
1034	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1035	N.S.	VWF-1	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	SS-3	PL-3			1,12,14,25
1036	L.V.	VWF-1	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1					10
1037	Conf.	CPT-1	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1					
1038	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1039	Clean	SV-2	RB-1	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1			PL-1	PL-1	SS-3	PL-3			5,6
1040	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1041	Soiled	SV-2	SC	P-1	P-1	P-1	P-1			PL-1	PL-1	SS-3	PL-3			6
1042	Stor.	SV-2	SC	P-1	P-1	P-1	P-1			PL-1	PL-1					10
1043	Counsel.	CPT-1	RB-1	WVC4/WVC/WVC4/WVC/WVC4/WVC3					TB-1	PL-1	PL-1	PL-2	PL-3			9,10
1044	Elec.	SV-2	RB-1	P-1	P-1	P-1	P-1									
1045	Pub. T.	T-1	T-1	T-2/T-3	T-2/T-3	T-2/T-3	T-2/T-3					QS-1				26
1046	Hall	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1046A	Alcove	VWF-1	RB-1	P-1	P-1	P-1			TB-1	PL-1	PL-1	PL-2	PL-3			10
1046B	D.F.	VWF-1	RB-1	P-1		P-1	P-1									
1047	Hall	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1048	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1049	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1051	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1052	Support	SV-2	RB-1	P-1	P-1	P-1	P-1			PL-3	PL-3					
1053	Hall	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1054	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1055	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1056	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1057	Hall	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1057A	Alcove	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1057B	Alcove	VWF-1	RB-1	P-1	P-1	P-1	P-1									

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
1058	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1059	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1061	Cont.	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
1062	Simul. 2/HDR	SV-1	SC	P-1	P-1	P-1	P-1			PL-1	PL-1	SS-3	PL-3			5,6
1063	Corridor	VWF-1/2	RB-1	P-1	P-1	P-1	P-1									29
1064	Pat. T.	SV-2	SC	EP-3	EP-1	EP-1	EP-1									
1065	Sub-Wait	CPT-1	RB-1		VWC-2	VWC-2										
1066	H.C. Dr.	CPT-1	RB-1	P-1	VWC-2	P-1	P-1									
1067	Dr.	CPT-1	RB-1	P-1	VWC-2	P-1	P-1									
1068	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1071	Corridor	VWF-1/2	RB-1	P-1	P-1	P-1	P-1									29
1071A	Alcove	VWF-1	RB-1	WP-1/P-1	WP-1/EP-1	WP-1/EP-1										
1072	Exam/Pediatric	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
1073	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1073A	Hold	VWF-1	RB-1	P-1		P-1	P-1	CC-1								
E1081	Corridor	VCT-1	RB-1													
1082	Vest.	VCT-1	RB-1													
1083	Elec. Trans.	VCT-1	RB-1													
1084	Corridor	VCT-1	RB-1	P-1	P-1	P-1	P-1									
1085	Corridor	VCT-1	RB-1	P-1	P-1	P-1	P-1									
1086	AGVS Soiled	VCT-1	RB-1	P-1	P-1	P-1	P-1									
1087	I.S.	VCT-1	RB-1	P-1	P-1	P-1	P-1									
1088	AGVS Clean	VCT-1	RB-1	P-1	P-1	P-1	P-1									
1089	Hskp.	VCT-1	RB-1	P-1	P-1	P-1	P-1									
1091	Mech.	?														
1092	Chiller	?														
1093	Elec. Trans.	?														
1094	Elec. Trans.	?														
1095	Mech.	?														
1097	Hall	?														

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
	elev. 19	?														
	elev. 20	?														
S1-1	Stair	?														
1098	Elev. Lobby	?														
1099	Corridor	?														
E1101	I.S.															
E1102	I.S.															
E1103	Elec.															
E1104	Elec.															
E1105	Elec.															
E1106	Mech.															
E1107	Corridor															
E1108	I.S.															
E1111	Parking															
E1112	Vest.	WM-1	?		P-1		T-4									
1113	Wait	WF1/CPT	RB-1		VWC-4	VWC-4				PL-1	PL-1	QS-1				10,30
1114	Recep.	CPT-2	RB-1				T-4			PL-1	PL-1	QS1/SS3				1,28
1115	Work	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	SS-3	PL-3			
1116	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									29
E1117	Corridor	?														
E1118	Pub. T.	T-1	T-1	T-2/T-3	T-2/T-3	T-2/T-3	T-2/T-3					QS-1				26
E1119	Hskp.	SV-2	RB-1	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1									
	ELEV. 13															
	ELEV. 14															
S0-1	Stair	?														
E1121	Elev. Lobby	VWF-1	RB-1	P-1	P-1	P-1	P-1									
E1122	Dark Hall	?														
E1124	Cont.	parate project														
E1125	Simul. 1	parate project														
E1126	Equip.	parate project														

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
E1127	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
E1128	RT-2	SV-1	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1	SS-3				
E1129	RT-1	SV-1	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1	SS-3				
E1131	Corridor	SV-1	RB-1	P-1	P-1	P-1	P-1									
E1131A	Cont.	SV-1	RB-1	P-1	P-1	P-1	P-1									
E1131B	Cont.	SV-1	RB-1	P-1	P-1	P-1	P-1									
1131C	N.S.	VWF-1	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2				
E1131D	N.S.															
E1132	Office															
E1133	Hall															
E1134	Read															
E1135	Block															
E1136	Office															
E1137	Hall															
E1138	Wait															
E1139	Office															
E1141	N.S.															
E1142	Wait															
E1143	Hall															
E1144	T.															
E1145	Dr.															
E1146	T.															
E1147	Exam															
E1148	Clean															
E1149	Hall															
E1151	Exam															
E1152	Soiled															
E1153	Elec.	SV-2	SC	P-1	P-1	P-1	P-1									
E1154	Exam															
E1155	Hall															

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
E1156	Exam															
E1157	Recep.															
E1158	Wait															
E1159	Corridor															
1161	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3		10	
1162	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			
1163	Hall	VWF-1	RB-1	P-1	P-1	P-1	P-1									
1164	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3		10	
1165	Sub-Wait	CPT-1	RB-1	P-1/VWC-2	P-1/VWC-2	P-1/VWC-2	P-1/VWC-2									
1166	Dr.	CPT-1	RB-1	P-1	P-3	P-1	P-1			PL-1	PL-1				23,24	
1167	Dr.	CPT-1	RB-1	P-1	P-3	P-1	P-1			PL-1	PL-1				23,24	
1168	Hall	VWF-1	RB-1		P-1		P-1									
1169	Pat. T.	SV-2	SC	EP-1	EP-1	EP-3	EP-1									
1171	H.C. Dr.	CPT-1	RB-1	P-1	P-1	P-1	P-3			PL-1	PL-1				23,24	
1172	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1	PL-2	PL-3		10	
1173	Hall	VWF-1	RB-1		P-1	P-1	P-1									
1174	Clean	SV-2	SC	WP-1/P-1	WP-1/P-1	WP-1/P-1	P-1			PL-1	PL-1	SS-3	PL-3		5,6	
1175	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1	PL-2	PL-3		10	
1176	Soil	SV-2	SC	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1			PL-1	PL-1	SS-3	PL-3		6	
1177	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1	PL-2	PL-3		10	
1178	Hall	VWF-1	RB-1		P-1	P-1										
1178A	Alcove	VWF-1	RB-1	WP-1/P-1		WP-1/P-1	WP-1/P-1									
1181	Stor.	SV-2	SC	P-1	P-1	P-1	P-1									
1182	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3		10	



## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West	CURTAIN	BOARD	Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
<b>2nd Floor</b>																
2001	Vest.	WM	RB	P	P	P	P									
2001A	W.C.	WM	RB	P	P	P	P									
2002	Wait	TZ	SC	DWP	-	DWP	P									
2003	Security Wait	WM	RB	DWP	P	P	P									
2004	Security	TZ	SC	P	P	P	P									
2005	Self Check	TZ	SC	P	P	P	P									
2006	Recep.	TZ	SC	P	P	P	P									31
	elev. 21	SV	RB	FRL	FRL	FRL	FRL									
	elev. 22	SV	RB	FRL	FRL	FRL	FRL									
S2-2	Stairs	RT	RB	P	P	P	P									
2007	Elev. Lobby	TZ	SC	P	P	P	P									
2008	V.P. Support	VCT	RB	P	P	P	P		TB	PL	PL	PL				
2009	Wait	TZ	SC	DWP	-	P	DWP									
2011	Ph./Info./Vend.	TZ	SC	P	P	P	P									
2012	Hall/D.F.	TZ	SC	P	P	P/T	P									
2013	Pub. T.	TZ	SC	T/P	T/P	T/P	T/P									32
2014	Pub. T.	TZ	SC	T/P	T/P	T/P	T/P									32
2015	Quiet	CPT	RB	P	P	VWC	VWC									
2016	Corridor	TZ	SC		WP/P		WP/P									
2017	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2018	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2019	Corridor															
2021	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2022	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2023	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2024	Hskp.	SV	RB	P	P	P	P			PL	PL					
2025	Exam	VWF	RB	P	P	P	AP	CC		PL	PL	SS				32
2026	X-Ray	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				32
2027	Cont.	SV	RB	P	P	P	P			PL	PL	SS				

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
2028	Corridor	VT	RB	WP/P		WP/P										30
2029	Read	SV	RB	P	P	P	P			PL	PL	SS				32
2031	Cont.	SV	RB	P	P	P	P			PL	PL	SS				
2032	X-Ray	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				32
2033	Low Voltage	SV	RB	P	P	P	P									
2034	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2035	Exam	SV	RB	WP/P	AP	WP/P	WP/P	CC		PL	PL	SS				32
2036	Corridor	VT	RB		WP/P	WP/P	WP/P									30
2037	Exam	SV	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
2038	Exam	SV	RB	WP/P	WP/P	AP	WP/P	CC		PL	PL	SS				32
2039	Exam	SV	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2041	Exam	SV	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2042	Pub. T.	TZ	SC	T/EP	T/EP	T/EP	T/EP									32
2043	Pub. T.	TZ	SC	T/EP	T/EP	T/EP	T/EP									32
2044	Hall/D.F.	TZ	SC	P	P	P	P									
2045	Quiet	CPT	RB	P	VWC	VWC	P									
2046	Ph./Info./Vend.	TZ	SC	P	P	P	P									
2047	Corridor	TZ	SC		WP/P		WP/P									30
2048	Triage	TZ	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2049	Staff T.	VT	RB	P	P	P	P									
2050	Not Used															
2051	Hall/Wait	VT	RB	WP/P		WP/P										
2052	Triage	TZ	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2053	Staff T.	SV	RB	WP/EP	WP/EP	WP/EP	WP/EP									
2054	Work	TZ	SC	WP/P	WP/P	WP/P	WP/P									
2055	Work	TZ	SC	WP/P	WP/P	WP/P	WP/P									
2056	Office	VT	RB	P	P	P	P		TB	PL	PL	PL				
2058	Office	VT	RB	P	P	P	P		TB	PL	PL	PL				
2059	Triage	TZ	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
2061	Elec.	SV	RB	P	P	P	P									

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
2062	Triage	TZ	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
2063	Dis.	VT	RB	P	P	P	P			PL	PL	PL				
2064	Hall/Wait	VT	RB	WP/P		WP/P										
2071	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2072	Phy. Work	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2073	Corridor	VT	RB				WP/P									30
2074	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2075	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2076	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2077	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2078	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2079	Corridor	VT	RB				WP/P									30
2081	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2082	Isolation Exam	SV	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2083	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2084	Ante	VT	RB	P	P	P	P									
2085	Isolation Exam	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2086	Phy. Work	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2087	Corridor	VT	RB				WP/P									30
2088	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2089	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2091	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2092	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2093	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2094	Corridor	VT	RB		WP/P		WP/P									30
2094A	Alcove	VT	RB	WP/P	WP/P	WP/P										
2095	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2096	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
2097	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2098	Stor.	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL					
2099	Corridor	VT	RB		WP/P		WP/P									30
2099A	Alcove	VT	RB	WP/P	WP/P	WP/P										
2101	Pharm.	SV	RB	P	P	P	P		TB	PL	PL	SS			31, 32	
2102	Equip.	VCT	RB	WP/P	WP/P	WP/P	WP/P			PL	PL					
2103	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2104	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2105	Elec.	SV	RB	P	P	P	P									
2106	Corridor	VT	RB		WP/P		WP/P									30
	elev. 19	SV	RB	FRL	FRL	FRL	FRL									
	elev. 20	SV	RB	FRL	FRL	FRL	FRL									
S1-2	Stair	RT	RB	P	P	P	P									
2107	Elev. Lobby	VT	RB	WP/P	WP/P	WP/P	WP/P									
2108	Corridor	VT	RB	WP/P	WP/P											30
2109	Trauma	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
2111	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2112	Corridor	VT	RB		WP/P											30
2113	phys.work	VT	RB	P	P	P	P		TB	PL	PL	SS				32
2114	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2115	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2116	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2117	Corridor	VT	RB		WP/P											30
2118	Isolation Exam	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
2119	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2121	Ante	VT	RB	P	P	P	P									
2122	Isolation Exam	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2123	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2124	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2125	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
2126	Corridor	VWF	RB		WP/P											30
2127	Phys. Work	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2128	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2129	Staff T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2131	Meds	SV	SC	P	P	P	P			PL	PL	SS				32
2132	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2133	Corridor	VT	RB	WP/P		WP/P										30
2134	Stor.	SV	RB	P	P	P	P			PL	PL					
2135	AGVS Soiled	VCT	RB	P	P	P	P									
	F-lift															
2136	I.S.	SV	RB	P	P	P	P									
2137	AGVS Clean	VCT	RB	P	P	P	P									
2138	Corridor	VT	RB	WP/P		WP/P										30
2139	Staff T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2141	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
2142	Meds	SV	RB	P	P	P	P			PL	PL	SS				32
2143	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2144	Corridor	VT	RB	WP/P		WP/P										30
2144A	Chart	VT	RB	WP/P	WP/P		WP/P			PL	PL	SS				
2145	Secure Holding	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2146	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2147	Corridor	VT	RB	WP/P		WP/P										30
2148	Secure Holding	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2149	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2151	Soiled	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				32
2152	Corridor	VT	RB	WP/P		WP/P										30
2153	Stor.	SV	RB	P	P	P	P			PL	PL					
2154	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2155	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2156	Corridor	VT	RB	WP/P		WP/P										30

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ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
2157	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2158	Meds	SV	RB	P	P	P	P			PL	PL	SS				32
2159	Corridor	VT	RB	WP/P		WP/P										30
2159A	Alcove															
2161	Trauma	SV	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
2162	Corridor	VT	RB	WP/P		WP/P										
2163	Meds	SV	RB	P	P	P	P			PL	PL	SS				30
2164	Hskp.	SV	RB	P	P	P	P			PL	PL					32
2165	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
2166	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2167	Corridor	VT	RB	WP/P		WP/P										30
E2171	Exam															
E2172	T.															
E2173	Exam															
E2174	Exam															
E2175	Exam															
E2176	Exam															
E2177	Exam															
E2178	Corridor															
E2180	Trauma															
E2181	N.S.															
E2182	Corridor															
E2183	T.															
E2184	Exam															
E2185	Vitals															
E2186	Exam															
E2187	Vitals															
E2188	Corridor	VT	RB	WP/P		WP/P										30
E2189	Exam															
E2191	Vitals															

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ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
E2192	Corridor	VT	RB		WP/P		WP/P									30
E2193	Mech.	EX														
	elev. 1	EX														
	elev. 2	EX														
S3-2	Stairs	EX														
E2194	Corridor	VT	RB	WP/P		WP/P										30
2194A	Chart	VT	RB	WP/P												
	elev. 3	EX														
	elev. 4	EX														
E2195	Sprinkler	EX														
E2196	Corridor	VT	RB		WP/P		WP/P									30
2196A	Alcove															
E2197	AGVS Soiled															
E2198	Elec.	EX														
E2299	AGVS	EX														
E2201	Mech.	EX														
E2202	Corridor	VT	RB	WP/P		WP/P										30
E2203	Clinical Decision	VT	RB													
E2204	Regis.															
E2205	T.															
E2206	Work.															
E2207	Triage															
E2208	Triage															
E2209	Corridor	VT	RB	WP/P		WP/P										30
2210	Triage															
E2211	Secure															
E2212	Recep.															
E2213	T.															
E2214	T.															
E2215	Corridor															

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ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
E2216	Wait															
E2217	Triage															
E2218	Corridor	VT	RB		WP/P		WP/P									
E2219	Entry	WM	RB	WP/P	WP/P	WP/P	WP/P									30
E2220	Triage															
E2221	Work															
E2222	Paramedic															
E2223	Vest.															
E2224	Exam															
E2225	T.															
E2226	Exam															
E2227	Corridor															
E2228	N.S.															
E2229	N.S.															
E2231	Exam															
E2232	Exam															
E2233	Exam															
E2234	Corridor															
E2234A	Chart															
E2235	Exam															
E2236	Meds															
E2237	T.															
E2238	Corridor															
E2238A	Alcove															
E2239	Exam															
E2241	T.															
E2242	Hskp.															
E2243	Hskp.															
E2244	Stor.															
E2245	Stor.															



## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
E2246	Clean															
E2247	Exam															
2251	Trauma	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2252	Corridor	VT	RB		WP/P											30
2252A	Alcove	VT	RB	WP/P	WP/P	WP/P										
2252B	Alcove	VT	RB	WP/P	WP/P	WP/P										
2253	Phy. Work	VT	RB	P	P	P	P		TB	PL	PL	SS				
2254	Trauma	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2255	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2256	Corridor	VT	RB		WP/P		WP/P									30
2257	N.S.	VT	RB	P	P	P	P		TB	PL	PL	SS				31
2258	Trauma	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2259	Corridor	VT	RB	WP/P	WP/P	WP/P										30
2259A	Alcove	VT	RB	WP/P	WP/P		WP/P									
2260	Not Used															
2261	Meds	SV	RB	P	P	P	P			PL	PL	SS				32
2262	Clean	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				32
2263	Corridor	VT	RB		WP/P		WP/P									30
2264	Trauma	SV	SC	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				32
2265	Soiled	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				32
2266	Staff T.	SV	SC	WP/P	WP/P	WP/P	WP/P									
2267	Hskp.	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL					
2270	Equip.	SV	RB	WP/P	WP/P	WP/P	WP/P									
2271	Quiet	CPT	RB	VWC	P	P	P									
2272	Stor.	SV	RB	WP/P	WP/P	WP/P	WP/P									
2273	Stor.	SV	RB	WP/P	WP/P	WP/P	WP/P									
2274	Comm. Resource	VT	RB	P	P	P	P			PL	PL	PL				
2275	Pub. T.	SV	RB	WP/EP	WP/EP	WP/EP	WP/EP									
2276	Hall	VT	RB	WP/EP	WP/P		WP/P									
2276A	Alcove	VT	RB	WP/P		WP/P	WP/P									

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
2277	Social Services	CPT	RB	P	P	P	P		TB	PL	PL	PL				
2278	Office	CPT	RB	P	P	P	P		TB	PL	PL	PL				
2279	Security	VCT	RB	P	P	P	P		TB	PL	PL	SS				
2281	Lost & Found	VCT	RB							PL	PL	PL				
2282	Office	CPT	RB	P	P	P	P		TB	PL	PL	PL				
2283	Office	CPT	RB	P	P	P	P		TB	PL	PL	PL				
2284	Stor.	SV	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	PL				
2285	Vest.	WM	RB	P		P										
2285A	Alcove															
2286	Ambul. Bay	N/A														
2287	Decon. Shower	T	TB	EP	EP	EP	EP									
2288	EMT	VT	RB	P	P	P	P		TB	PL	PL	SS				32
2289	Lounge	VT	RB	P	P	P	P		TB	PL	PL	SS				32
2291	Lockers	VT	RB	P	P	P	P									
2292	Staff T.	SV	RB	WP/EP	WP/EP	WP/EP	WP/EP									
2293	Hall/Alcove	VT	RB	P	P	P	P									
2294	Pat. T.	SV	RB	WP/EP	WP/EP	WP/EP	WP/EP									
2295	Corridor	VT	RB		WP/P		WP/P									30
2296	C.T.	SV	RB	WP/P	WP/P	WP/P	MA			PL	PL	SS				32
2297	Cont.	SV	RB	P	P	P	P			PL	PL	SS				
2298	Equip.	VCT	RB	WP/P	WP/P	WP/P	WP/P									
2299	Shelled/Stor.	VCT	RB	P	P	P	P			PL	PL					
	elev. 13	N/A														
	elev. 14	N/A														
S0-2	Stairs	N/A														

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION			FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK			CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
3rd Floor																
3001	Corridor	TZ	SC	WP/P		WP/P	WP/P									
3002	Corridor	TZ	SC	WP/P	WP/P		WP/P			PL	PL	PL				
3002A	ATM/Vend/D.F./P.H.	TZ	SC	WP/P	WP/P	WP/P	WP/P			PL	PL	PL				
3003	Mens	T	T	T	T	T	T			PL	PL	SS				
3004	Womens	T	T	T	T	T	T			PL	PL	SS				
3005	Wait	TZ	SC	VWC												
3006	Corridor	TZ	SC							PL	PL	SS				
3007	Elec.	VCT	RB	P	P	P	P									
3008	W.C.	TZ	SC	WP/P	WP/P	WP/P	WP/P									
3009	Wait	TZ	SC		GLASS/T	GLASS/T				PL	PL	SS				
3010	Wait	TZ	SC		GLASS/T	GLASS/T				PL	PL	SS				
3011	Recep.	TZ	SC	Glass/VWC					TB	PL	PL	SS				
3011A	Work	TZ	SC	P	P	P	P									
3012	Corridor	TZ	SC			WP/P	WP/P									
3013	Hall/Info.	NOT USED														
3014	Stor.	VCT	RB	P	P	P	P									
3015	Stor.	NOT USED														
3016	Office	CPT	RB	P	P	P	P		TB	PL	PL	PL				
3017	Chapel Lobby	TZ	SC	WP/P	WP/P	WP/P	WP/P									
3018	Chapel	CPT	RB	VWC	VWC	VWC	VWC									
	elev. 21	SV	SC	FRL	FRL	FRL	FRL									
	elev. 22	SV	SC	FRL	FRL	FRL	FRL									
S2-3	Stair	RT	RB	P	P	P	P									
3019	Elev. Lobby	TZ	SC	WP/P	WP/P	WP/P	WP/P									
3020	Wait	TZ	SC	VWC	VWC	VWC	VWC									
3021	Pharm. Pick-Up	TZ	SC	P	P	P	P					SS				
3022	Pharm.	SV	RB	P	P	P	P		TB	PL	PL	PL/SS				
3023	Corridor	VT	RB	WP/P		WP/P	WP/P									
3024	Office	CPT	RB	P	P	P	P		TB	PL	PL	PL				

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
3025	Shelled	VCT	RB	P	P	P	P									
3026	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3027	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3028	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3029	Corridor	VT	RB	WP/P	WP/P	WP/P	WP/P									
3030	Corridor	VT	RB	WP/P		WP/P	WP/P									
3031	Staff T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3032	Isolation Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				
3033	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3034	Ante	VWF	RB	P	P	P	P									
3035	Corridor	VT	RB	WP/P		WP/P										
3036	Isolation Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				
3037	Equip.	VCT	RB	WP/P	WP/P	WP/P	WP/P									
3038	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3039	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3041	Corridor	VT	RB	WP/P		WP/P										
3042	Ante	VWF	RB	P	P	P	P									
3043	Isolation Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				
3044	Pat. T.	SV	SC	WP/E/P	WP/EP	WP/EP	WP/EP									
3045	Stor.	VCT	RB	P	WP/P	WP/P	WP/P									
3046	Corridor	VT	RB		WP/P		WP/P									
3046A	Alcove	VT	RB	WP/P	WP/P	WP/P	WP/P			PL	PL					
3046B	Alcove	VT	RB	WP/P		WP/P	WP/P			PL	PL					
3047	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL					
3048	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL					
3049	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL					
3051	Stor.	VCT	RB	P	P	P	P									
3052	Corridor	TZ	SC	WP/P	WP/P		WP/P									
3053	Triage	TZ	SC	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				
3054	Work	VT	RB	P	P	P	P			PL	PL	PL				

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
3055	Dis.	VT	RB	P	P	P	P		TB	PL	PL	PL				
3056	Hall	TZ	SC	WP/P		WP/P						SS				
3057	Work	TZ	SC	P	P	P	P									
3058	Dis.	VT	RB	P	P	P	P		TB	PL	PL	PL				
3059	Office	VT	RB	P	P	P	P		TB	PL	PL	PL				
3061	Triage	TZ	SC	WP/P	WP/P	WP/P	WP/P			PL	PL	SS				
3062	Corridor	TZ	SC		WP/P		WP/P					SS				
3065	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3066	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3067	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3068	Corridor/Alcove	VT	RB	WP/P		WP/P	WP/P									
3069	Phys. Work	VT	RB	P	P		P		TB	PL	PL	SS				
3071	Corridor	VT	RB				WP/P									
3072	N.S.	VT	RB	P	P	P			TB	PL	PL	SS				
3073	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3074	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3075	Pat. T.	SV	SC	WP/EP	WPE/P	WP/EP	WP/EP									
3076	Corridor	VT	RB	WP/P	WP/P		WP/P									
3077	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3078	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3079	N.S.	VT	RB	P	P	P			TB	PL	PL	SS				
3081	Corridor	VT	RB	WP/P			WP/P									
3082	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3083	Hall/Alcove	VT	RB	WP/P		WP/P	WP/P									
3084	Hskp.	SV	SC	WP/P	P	WP/P	WP/P									
3085	Shelled Exam	VCT	RB	P	P	P	P									
3086	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3087	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3088	Dining	VWF	RB	WP/P	WP/P	WP/P	WP/P		TB							
3089	Kitchen	VWF	RB	P	P	P	P		TB	PL	PL	SS				

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
3090	Lounge	VWF	RB	WP/P	WP/P	P	P		TB							
3091	Mail	VWF	RB	P	P	P	P		TB	PL	PL	PL				
3092	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3093	Corridor	VT	RB	WP/P		WP/P										
3094	Pat. Sh.	SV	SC	EP	EP	EP	EP									
3095	Staff Sh.	SV	SC	EP	EP	EP	EP									
3096	Lockers	VWF	SC	P	P	P	P		TB	PL	PL					
3097	Hall	VWF	RB	WP/P		WP/P	WP/P									
3098	Office	CPT	RB	P	P	P	P		TB	PL	PL	PL				
3099	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3101	Staff T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3102	Office	CPT	RB	P	P	P	P		TB	PL	PL	PL				
3103	Work	VCT	RB	P	P	P	P			PL	PL	PL				
3104	Corridor	VT	RB	P	WP/P		WP/P									
3105	Elec.	VCT	RB	P	P	P	P									
E3106	Mech.	CONC														
3107	Corridor	VT	RB	WP/P	WP/P	WP/P	WP/P									
3108	Pub. T.	SC	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3109	Pub. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
	elev. 19	SV	SC	FRL	FRL	FRL	FRL									
	elev. 20	SV	SC	FRL	FRL	FRL	FRL									
S1-3	Stairs	RT	RB	P	P	P	P									
3111	Elev. Lobby	VT	RB	WP/P	WP/P	WP/P	WP/P									
3112	Staff T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3113	Office	CPT	RB	P	P	P	P	TB		PL	PL	PL				
3114	Hall	CPT	RB	P	P	P	P									
3115	Office	CPT	RB	P	P	P	P	TB		PL	PL	PL				
3116	Cont.	SV	RB	P	P	P		TB		PL	PL	PL				
3117	X-Ray	SV	RB	P	P	P	WP/P			PL	PL	SS				
3118	Pat. T.	SV	RB	WP/EP	WP/EP	WP/EP	WP/EP									

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
3119	Corridor	VT	RB		WP/P		WP/P									
3119A	Alcove	VT	RB	WP/P	WP/P	WP/P										
3120	Pat. Sh.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3121	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	PL				
3122	Corridor	VT	RB	WP/P	WP/P	WP/P										
3123	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	PL				
3124	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3125	N.S.	VT	RB				P		TB	PL	PL	SS				
3125A	Alcove	VT	RB	WP/P	WP/P	WP/P	WP/P									
3126	Corridor	VT	RB	WP/P	WP/P		WP/P		TB							
3126A	Alcove	VT	RB	WP/P	WP/P	WP/P										
3127	Exam	VWT	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3128	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3129	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3130	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/WP									
3131	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3132	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3133	Corridor	VT	RB	WP/P	WP/P	WP/P										
3134	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3135	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3136	N.S.	VT	RB				P		TB	PL	PL	SS				
3137	Corridor	VT	RB		WP/P											
3137A	Alcove	NOT USED														
3138	Phys. Work	VT	RB				P		TB	PL	PL	SS				
3139	Stor.	VCT	RB	P	P	P	P			PL	PL					
3141	AGVS Soiled	VCT	RB	P	P	P	P			PL	PL	SS				
	F-lift															
3142	I.S.	VCT	RB	P	P	P	P									
3143	AGVS Clean	VCT	RB	P	P	P	P			PL	PL	SS				
3144	Meds	SV	SC	P	P	P	P			PL	PL	SS				

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
3145	Hskp.	SV	SC	P	P	P	P			PL	PL					
3146	Corridor	VT	RB	WP/P		WP/P										
3147	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3148	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3149	Exam	VWF	RB	WP/P	WP/P	WP/P	WP/P	CC		PL	PL	SS				
3150	Corridor	VT	RB	WP/P		WP/P				PL	PL	SS				
3151	Pat. T.	SV	SC	WP/EP	WP/EP	WP/EP	WP/EP									
3152	Low Voltage	VCT	RB	P	P	P	P									
3153	Meds	SV	RB							PL	PL	SS				
3154	Not Used															
E3161	Corridor															
E3162	Corridor															
E3163	T.															
E3164	Pub. T.															
3165	South Sky Bridge	TZ	SC	P	P	P	P									
3166	Corridor	CPT	RB	P		P										
3167	North Sky Bridge	VT	RB	P	P	P	P									



## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West	CURTAIN	BOARD	Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
<b>4th Floor</b>																
4000	Wait	CPT-1	RB-1	W-1	W-1/P-1		W-1									21
4001	Recep.	CPT-2	RB-1						TB-1	PL-1	PL-1	QS-1/SS-3				1,2
4002	Admit.	CPT-2	RB-1							PL-1	PL-1	SS-3				3
4003	Wait	CPT-1	RB-1		W-1/P-1	W-1	W-1									21
4004	Pat. T.	SV-2	SC-2	SV-2/EP-3	SV-2/EP-3	SV-2/EP-3	SV-2/EP-1									4
4005	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
4006	Blood Draw	SV-2	SC-2	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1			PL-1	PL-1	SS-3				5,6,7,8
4007	Resource Center	CPT-1	RB-1	P-1	WP-1	WP-1	WP-1			PL-1	PL-1	PL-2	W-1			10
4008	Counsel.	CPT-1	RB-1	JWC4/VWC	VWC-3	JWC4/VWC	JWC4/VWC		TB-1	PL-1	PL-1	PL-2	PL-3			9,10
4009	Counsel.	CPT-1	RB-1	JWC4/VWC	JWC4/VWC	VWC-3	JWC4/VWC		TB-1	PL-1	PL-1	PL-2	PL-3			9,10
4010	Not Used															
4011	Corridor	VWF-1/2	RB-1	P-1	P-1	P-1	P-1									29
4012	Pat. T.	SV-2	SC-2	SV-2/EP-1	SV-2/EP-1	SV-2/EP-1	SV-2/EP-2									4
4013	N.S.	VWF-1	RB-1	P-2	P-2	P-2	P-2		?	PL-1	PL-1	SS-3/PL-2	PL-3			1,5,12,13,16
4014	Infusion	VWF-1	RB-1	P-2	P-2	P-2	P-2			?	?					
4015	Infusion	VWF-1	RB-1	P-3	P-3	P-3	P-3			?	?					
4016	N.S.	VWF-1	RB-1	P-3	P-3	P-3	P-3		?	PL-1	PL-1	SS-3/PL-2	PL-3			1,5,12,14,16
4017	Pat. T.	SV-2	SC-2	SV-2/EP-1	SV-2/EP-3	SV-2/EP-1	SV-2/EP-1									4
4018	Counsel.	CPT-1	RB-1	VWC-3	JWC4/VWC	JWC4/VWC	JWC4/VWC		TB-1	PL-1	PL-1	PL-2	PL-3			9,10
4019	Pat. T.	SV-2	SC-2	SV-2/EP-1	SV-2/EP-4	SV-2/EP-1	SV-2/EP-1									4
4021	N.S.	VWF-1	RB-1	P-4	P-4	P-4	P-4		?	PL-1	PL-1	SS-3/PL-2	PL-3			1,5,12,15,16
4022	Infusion	VWF-1	RB-1	P-4	P-4	P-4	P-4			?	?					
4023	Private Infusion	VWF-1	RB-1	P-4	P-4	P-4	P-4	CC-1		PL-1	PL-1	SS-3	PL-3			5
4024	Corridor	VWF-1/2	RB-1	P-1	P-1	P-1	P-1									29
4025	Elec.															
S2-4	Stair															
4026	Stair Lobby	VWF-1	RB-1	P-1	P-1	P-1	P-1									
4027	Pat. T.	SV-2	SC-2	SV-2/EP-1	SV-2/EP-1	SV-2/EP-2	SV-2/EP-1									4
4028	N.S.	VWF-1	RB-1		P-2	P-2			?	PL-1	PL-1	SS-3/PL-2	PL-3			1,5,12,13,17
4029	Infusion	VWF-1	RB-1	P-2	P-2	P-2	P-2			?	?					

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
4031	Private Infusion	VWF-1	RB-1	P-2	P-2	P-2	P-2	CC-1		PL-1	PL-1	SS-3	PL-3			5
4033	Pat. T.	SV-2	SC-2	SV-2/EP-1	SV-2/EP-1	SV-2/EP-3	SV-2/EP-1									4
4034	N.S.	VWF-1	RB-1		P-3	P-3			?	PL-1	PL-1	SS-3/PL-2	PL-3			1,5,12,14,17
4035	Infusion	VWF-1	RB-1	P-3	P-3	P-3	P-3			?	?					
4036	Private Infusion	VWF-1	RB-1	P-3	P-3	P-3	P-3	CC-1		PL-1	PL-1	SS-3	PL-3			5
4037	Pat. T.	SV-2	SC-2	SV-2/EP-1	SV-2/EP-1	SV-2/EP-4	SV-2/EP-1									4
4039	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
4039A	Alcove	VWF-1	RB-1	FRL-1		FRL-1	FRL-1									
4039B	Alcove	VWF-1	RB-1	P-1	P-1	P-1				PL-1	PL-1					10
4039C	Alcove	VWF-1	RB-1	P-1	P-1	P-1				PL-1	PL-1					10
4039D	Alcove	VWF-1	RB-1	FRL-1		FRL-1	FRL-1									
4041	Pharm. Work	SV-1	SC-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4042	Pharm. Ante	SV-1	SC-1	WP-1/EP-1	WP-1/EP-1	EP-1	WP-1/EP-1			PL-1	PL-1	SS-3	PL-3			10,6
4043	Pharm. Clean	SV-1	SC-1	WP-1/EP-1	WP-1/EP-1	WP-1/EP-1	WP-1/EP-1									
4044	Pharm. Chemo	SV-1	SC-1	WP-1/EP-1	WP-1/EP-1	WP-1/EP-1	WP-1/EP-1									
4045	Wait	CPT-1	RB-1	VWC-2	VWC-2	VWC-2	VWC-2									
4046	Quiet/Counsel.	CPT-1	RB-1	VWC4/VWC3	VWC3	VWC4/VWC3	VWC4/VWC3	TB-1		PL-1	PL-1	PL-2	PL-3			10
4049	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
4049A	Alcove	VWF-1	RB-1	FRL-1	FRL-1		FRL-1									
4049B	Scale	VWF-1	RB-1	FRL-1	FRL-1		FRL-1			PL-1	PL-1					
4051	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1	TB-1		PL-1	PL-1	PL-2	PL-3			10
4052	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1	TB-1		PL-1	PL-1	PL-2	PL-3			10
4053	Office	CPT-2	RB-1		P-1		P-1	TB-1		PL-1	PL-1	PL-2	PL-3			10
4060	L.V.	VCT-1	RB-1	P-1	P-1	P-1	P-1									
4061	N.S.	VWF-1	RB-1		P-4	P-4			?	PL-1	PL-1	SS-3/PL-2	PL-3			1,5,12,15,17
4062	Infusion	VWF-1	RB-1	P-4	P-4	P-4	P-4			?	?					
4063	Private Infusion	VWF-1	RB-1	P-4	P-4	P-4	P-4	CC-1		PL-1	PL-1	SS-3	PL-3			5
4064	Stor.	VCT-1	RB-1	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1									
4065	Exam	VWF-1/2	RB-1	FRL-1	P-1	P-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4066	Exam	VWF-1/2	RB-1	FRL-1	P-1	P-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4067	Exam	VWF-1/2	RB-1	FRL-1	P-1	P-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4068	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									

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ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
4069	Stor.	VWF-1	RB-1	P-5	P-5	P-5				PL-1	PL-1		PL-3			
4071	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4072	Pat. T.	SV-2	SC-2	SV-2/EP-1	SV-2/EP-2	SV-2/EP-1	SV-2/EP-1									4
4073	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			
4074	Hall	VWF-1	RB-1	P-5		P-5										
4075	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									
4076	N.S.	VWF-1	RB-1	P-5	P-5	P-5	P-1		TB-1	PL-1	PL-1	SS-3	PL-3			20
4077	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4078	Stor.	VWF-1	RB-1	P-5	P-5	P-5				PL-1	PL-1		PL-3			10
4079	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									
4081	Pat. T.	SV-2	SC-2	SV-2/EP-4	SV-2/EP-1	SV-2/EP-4	SV-2/EP-4									4
4082	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4083	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4084	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4085	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4086	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4087	Work	CPT-2	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1	PL-2	PL-3			
4088	Hall/Stor.	VWF-1	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1		PL-3			
4089	Corridor	VWF-1/2	RB-1	P-1	P-1	P-1	P-1									29
4091	Stor.	VWF-1	RB-1	P-2	P-2		P-2			PL-1	PL-1		PL-3			
4092	Exam	VWF 1/2	RB-1	FRL-1	P-1	P-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4093	Hall	VWF-1	RB-1	P-2	P-2	P-2	P-2									
4094	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4095	Corridor	VWF-1/2	RB-1	P-1	P-1	P-1	P-1									29
4096	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4097	N.S.	VWF-1	RB-1	P-5	P-5	P-5	P-1		TB-1	PL-1	PL-1	SS-3	PL-3			20
4098	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4099	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									
4101	Pat. T.	SV-2	SC	SV-2/EP-2	SV-2/EP-1	SV-2/EP-1	SV-2/EP-1									4
4102	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10 ?
4103	Hskp.	SV-2	SC	P-1	P-1	P-1	P-1									
4104	Stor.	SV-2	SC-2	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1									

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ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
4105	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									
4106	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4107	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4108	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4109	Corridor	?		P-1	P-1	P-1	P-1									
4111	Elec.	?														
	elec. 19	?														
	elec. 20	?														
S1-4	Stairs	?														
4112	Elev. Lobby	?														
4113	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4114	Staff T.	SV-2	SC-2	P-4	P-1	P-1	P-1									
4115	Staff T.	SV-2	SC-2	P-4	P-1	P-1	P-1									
4116	Lounge	VT-1	RB-1	P-1	P-1	P-4	P-1			PL-1	PL-1	SS-1	PL-3			6,10,11
4117	Mail	VT-1	RB-1	P-1	P-1	P-1	P-1			PL-1	PL-1					10
4118	Lockers	VT-1	RB-1	P-1	P-1	P-1	P-1									
4119	Hall	VT-1	RB-1	P-1	P-1	P-1	P-1									
4122	Counsel.	CPT-1	RB-1	WVC4/WVC/WC4/WVC/WVC4/WVC			VWC-3		TB-1	PL-1	PL-1	PL-2	PL-3			10
4123	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4124	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4125	Exam	VWF-1/2	RB-1	P-1	P-1	FRL-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4126	Stor.	VWF-1	RB-1	WP-1/P-5	WP-1/P-5	WP-1/P-5	WP-1/P-5									
4127	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									
4128	Pat. T.	SV-2	SC-2	SV-2/EP-2	SV-2/EP-1	SV-2/EP-1	SV-2/EP-1								4	
4129	Exam	VWF-1/2	RB-1	P-1	FRL-1	P-1	P-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4131	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									
4132	N.S.	VWF-1	RB-1	P-5	P-1	P-5	P-5		TB-1	PL-1	PL-1	SS-3	PL-3			20
4133	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4134	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4135	Stor.	VWF-1	RB-1	WP-1/P-5	WP-1/P-5	WP-1/P-5	P-5			PL-1	PL-1		PL-3			
4136	Hall	VWF-1	RB-1	P-5	P-5	P-5	P-5									
4137	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19

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ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
4138	Exam	VWF-1/2	RB-1	P-1	P-1	P-1	FRL-1	CC-1		PL-1	PL-1	SS-1	PL-3			6,18,19
4139	Proc.	VWF-1/2	RB-1	WP-1/P-1	WP-1/P-1	WP-1/P-1	P-1			PL-1	PL-1	SS-1	PL-3			6,18,19
4141	Hall	CPT-1	RB-1	W-1	W-1		P OR W?									21
4141A	Wait	CPT-1	RB-1	W-1	VWC-2	VWC-2										21
4142	Dis.	CPT-2	RB-1	P-1	P-1	P-1	P-1									
4143	Dis.	CPT-2	RB-1	P-1	P-1	P-1	P-1									
4144	Wait	CPT-1	RB-1	W-1	W-1/P-1		W-1									21
4145	Work	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2				
4146	File	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2				
4147	Work	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2				
4148	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
4148A	D.F.	VWF-1	RB-1	P-1	P-1	P-1										
4149	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4151	AGVS Soiled	SV-2	SC	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1			PL-1	PL-1	SS-3	PL-3			5,6
	F-lift															
4152	I.S.	SV-2	SC	P-1	P-1	P-1	P-1									
4153	Office	CPT-2	RB-1	P-1	P-1	P-1	P-1		TB-1	PL-1	PL-1	PL-2	PL-3			10
4154	AGVS Clean	SV-2	SC	WP-1/P-1	WP-1/P-1	WP-1/P-1	WP-1/P-1			PL-1	PL-1	SS-3	PL-3			5,6,10
4155	Staff T.	SV-2	SC	SV-2/P-5	SV-2/P-1	SV-2/P-5	SV-2/P-5			PL-1	PL-1	SS-3	PL-3			4
4156	Pub. T.	T-1	T-1	T-2/T-3	T-2/T-3	T-2/T-3	T-2/T-3					QS-1				26
4157	Exam	VT-1	RB-1	P-5/VWC-1	P-5	P-5/VWC-1	P-5/VWC-1	CC-1		PL-1	PL-1	SS-1	PL-3			7,10
4158	Exam	VT-1	RB-1	P-5/VWC-1	P-5	P-5/VWC-1	P-5/VWC-1	CC-1		PL-1	PL-1	SS-1	PL-3			7,10
4159	Exam	VT-1	RB-1	P-5/VWC-1	P-5	P-5/VWC-1	P-5/VWC-1	CC-1		PL-1	PL-1	SS-1	PL-3			7,10
4161	Corridor	VWF-1	RB-1	P-1	P-1	P-1	P-1									
4161A	Alcove	VWF-1	RB-1	P-1	P-1	P-1	P-1									
E4166	Lobby															
E4167	Elev. Lobby															
E4168	Lounge															
E4169	Hall															
4171	South Sky Bridge															
4172	Interstitial Space															
E4173	Pat. Room															

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ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
E4174	Pat. Room															
E4175	Corridor															
E4175A	Alcove															
E4176	Corridor															
E4177	Pat. Room															
E4178	T.															
4179	Stor.	?														
4181	Corridor	?														
	Elev. 13															
	Elev. 14															
S0-4	Stairs															
S2-5	Stairs															

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ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
<b>5th Floor</b>																
5001	Hskp. / Stor.															
5002	Hall															
5003	Plenum															
5004	Plenum															
5005	Mech.															
5007	Elec.															
5008	Corridor															
5009	Elec.															
5011	Elec.															
5012	Corridor															
	Elev. 19															
	Elev. 20															
S1-5	Stairs															
5013	Elev. Lobby															
5014	Corridor															
E5015	Corridor															
5016	North Sky Bridge															
E5019	Corridor															
E5020	Office															
E5021	Corridor															
5022	Stor.															
5023	Corridor															

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ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
<b>6th Floor</b>																
6001	Elev. Mach.															
6002	Elec.															
6003	Stor.															
	Elev. 19															
	Elev. 20															
S1-6	Stairs															
6004	Elev. Lobby															
6004A	Alcove															
6005	Interstitial Space															
E6006	Elec.															
E6011	Pat. Room															
E6012	Corridor															
E6013	Corridor															
E6014	Playroom															
6015	Corridor															
6015A	Alcove															



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ROOM INFORMATION		FLOOR		WALLS				CUBICLE CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
7th Floor																
7001	Elec.															
7002	Stor.															
	Elev. 19															
	Elev. 20															
S1-7	Stairs															
7003	Corridor															
7004	Elev. Lobby															
7005	Corridor															
7006	North Sky Bridge															
E7007	Corridor															

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ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
8th Floor																
S1-8	Stairs															
8001	Stor.															
8002	Elev. Lobby															
8003	Corridor															
8004	North Sky Bridge															
E8006	Corridor															

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ROOM INFORMATION		FLOOR		WALLS				CURTAIN	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
<b>9th Floor</b>																
S1-9	Stairs															
9002	Elev. Mach.															
9003	Mech.															
9005	Penthouse															

## SECTION 09 06 00 FINISH SCHEDULE

ROOM INFORMATION		FLOOR		WALLS				CUBICLE	TACK BOARD	CASEWORK				CEILING		REMARKS
Number	Name	Material	Base	North	East	South	West			Base	Wall	Counter-tops	Soffit / Fascia	Material	Finish	
		GENERAL NOTES:														
1				EB1 to be used with PL1 & PL2.												
2																
		REMARKS:														
1										19	Integral sink to be SS-2.					
2										20	SS-1 to be nurse station transaction counter top and front.					
3										21	Wood panel per architect specifications.					
4										22	PL-3 to be below chair rail, P-1 above chair rail.					
5										23	PL-1 to be used for built-in bench, locker cabinet, hamper/storage.					
6																
7										24	UF-1 & UF-2 as scheduled in Section 09 06 10.					
										25	Partial height wall to be FRL-1.					
8										26	Under mounted solid surface sink (SS-4).					
9										27	Column to be painted P-1.					
10										28	Quartz stone (QS-1) to be desk transaction counter and face (1114).					
11																
12										29	VWF-1 & VWF-2 (vinyl wood design pattern #2 for specific corridor intersections. Leaf pattern).					
13																
14										30	All corridors with VT (vinyl tile) to have ICON cut in random locations for way finding.					
15																
16										31	All reception desks, nurse stations, phys work & pharmacy pick up to possibly have combination of the following:					
17																
18																
										32	All rooms with sinks to have solid surface counters to have integral sinks.					

## SECTION 09 06 00 FINISH SCHEDULE

[illegible]



## SECTION 09 06 09 EXTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Veneer Brick 04 21 13	B-1	Manufacturer:	Interstate Brick	[---]
		Color:	Park Rose	
	B-2	Manufacturer:	Interstate Brick	[---]
		Color:	Mountain Red	
	B-3	Manufacturer:	Interstate Brick	[---]
		Color:	Mountain Red	
Composite Wall Panel 07 42 43	CWP-1	Manufacturer:	Una-Clad by Copper Sales, Inc.	[---]
		Type:	Composite Panel System Series 1500	
		Finish:	Hylar 5000/Kynar 500	
		Color:	Color 2	
Entrance Mats 12 48 13	EM-1	Manufacturer:	Shaw	[---]
		Name:	Welcome, EW24	
		Number:	59410	
		Color Name:	Beige	
		Color Number:	10123	
High Performance Coatings For Steel 09 96 00	HPS-1	Manufacturer:	Tnemec	[---]
		Primer:		
		Coating:		
		Color:		
Metal-Framed Skylights 08 63 00	MFS-1	Manufacturer:		[---]
		Material:	Aluminum Alloy	
		Glazing:	Laminated Glass	
		Frit Pattern:	1/8 in dots on 1/4 in centers	
		Finish	Color 1	
Roof Copings 07 62 00	RC-1	Manufacturer:	Contractor's Choice	
		Type:	A	
		Material:	Steel Sheet	
		Thickness:		
		Finish:	Zinc-coated (Galvanized)	
		Color:		
		Mfr Contact:		
	RC-2	Manufacturer:	Contractor's Choice	
		Type:	B	
		Material:	Alloy Aluminum	
		Thickness:	0.060 in	
Walk Off Mats 12 48 13	WM-1	Manufacturer:		
		Number:		
		Color Name:		
		Color Number:		
		Mfr Contact:		
Exterior Color Metals	Color 1, Dark	Manufacturer	Una-Clad	Custom or premium color as required. Match Architect's Sample
		Material	Kynar 500	
		Color	Medium Bronze	

## SECTION 09 06 09 EXTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Exterior Color Metals	Color 2, Light	Manufacturer	Proclad	Custom or premium color as required. Match Architect's Sample
		Material	Kynar 500	
		Color	Champagne Bronze	
Exterior Color	Color 3	Manufacturer		Obtain color requirements from Contracting Officer
		Color	MMC Greige	



## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Acoustical Ceiling Tiles 09 51 00	ACT-1	Manufacturer:	Armstrong	[---]
		Series:	Mesa	
		Item:	687	
		Edge:	Beveled Tegalur	
		Size:	24" x 24" x 3/4"	
		Color:	White	
	ACT-2	Manufacturer:	Armstrong	[---]
		Series:	Ultima Open Plan	
		Item:	1942	
		Edge:	Beveled Tegalur	
		Size:	24" x 24" x 3/4"	
		Color:	White	
	ACT-3	Manufacturer:	Armstrong	[---]
		Series:	Effects Wood Looks	
		Item:	2184U6A2FXCH	
		Edge:	Square Tegalur	
		Size:	24" x 24" x N/A"	
		Color:	Effects Cherry	
		NRC Rating:	0.90	
	ACT-4	Manufacturer:	Armstrong	[---]
		Series:	Fine Fissured / Ceramaguard	
		Item:	607	
		Edge:	Square	
		Size:	24" x 24" x 5/8"	
		Color:	White	
	ACT-5	Manufacturer:	See ACT-3	Same as ACT-3 except color
		Color:	Effects Maple	
Acoustical Suspension Assemblies 09 53 23	ASA-1	Manufacturer:	Armstrong	Use with ACT-1 & ACT-2, Accessories to match ASA-1
		Series	Silhouette XL, 9/16" Bolt Slot, 1/8" Reveal, Heavy Duty	
		Color	White	
	ASA-2	Manufacturer:	Armstrong	Use with ACT-3 & ACT-5, Accessories to match ASA-2
		Series	Same as ASA-1	
		Color:	Gunmetal Grey	
	ASA-3	Manufacturer:	Armstrong	Use with ACT-4, Accessories to match ASA-3
		Series	Prelude XL, 15/16" Heavy Duty	
		Color	White	
Acoustical Wall Treatment 09 83 10	AWT-1	Manufacturer:		[---]
		Fabric:		
		Size:		
		Color:		
		Mfr Contact:		
	AWT-2	Manufacturer:	Sound Silencer	[---]
		Fabric:		
		Size:	24" x 48"	
		Color:	White	
		Mfr Contact:		

## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Acoustical Wood Panels 09 77 14	AWP-1	Manufacturer:		
		Color:		
		Number:		
		Size:		
		Mfr Contact:		
Architectural Woodwork 06 40 00	AW-1	Species:	Plain sawn select [insert]	Interior Wood for Transparent Finish, solid wood
	AW-2	Species:	Quarter sawn select [insert]	Interior Wood for Transparent Finish, veneer
Carpet 09 68 00	CPT-1	Manufacturer:	Mannington	Public Areas at Floors 1 & 4
		Style:	Benchmark-HP	
		Number		
		Color:	Stone (ston)	
		Repeat:		
		Weight:		
		Mfr Contact:	Roberta Dillan (206) 714-4443	
	CPT-2	Manufacturer:	Mannington	Offices at Floors 1 & 4
		Style:	Viewpoint II-HP	
		Number		
		Color:	Stone (ston)	
		Repeat:		
		Weight:		
		Mfr Contact:	Roberta Dillan (206) 714-4443	
	CPT-3	Manufacturer:	Shaw	Offices & Quiet Rooms at Floors 2 & 3
		Style:	Performance Broadloom	
		Pattern:	Surefit-60567	
		Color:	Pistachio-64545	
		Repeat:		
		Weight:		
		Mfr Contact:	John Spigel (425) 830-8871	
Cubicle Curtains 10 21 23	CC-1	Manufacturer:	Interspec	Infusion pods, all exam rooms, acupuncture and massage at Floors 1 & 4
		Number:	2025/ Parallel	
		Color:	41/Earthen	
		Repeat:	Railroaded	
		Width:	72"	
		Mesh:		
		Mfr Contact:	Rick Deacon (732) 938-4114	
	CC-2	Manufacturer:	Gilford	All Exam Rooms at Floors 2 & 3
		Number:	701KC420	
		Style:	Seclusion	
		Color:	Kit & Caboodle, Universe	
		Repeat:	Railroaded	
		Width:	72"	
		Mfr Contact:	1-800-852-5454	

SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Decorative Panel	DP-1	Manufacturer:	Lumicor	Massage and Acupuncture 4157, 4148, 4159 privacy wall by sink counter
		Style:	Botanicals	
		Pattern:	Natural Leaves	
		Number:	AB-803-101-AK-236, glass/frost	
		Mfr Contact:	Don & Kimberly Myrick, Hartman LTD, Inc. (206) 842-1846	
	DP-2	Manufacturer:	Lumicor	Entrance reception desk-front at Floors 1 & 4
		Style:	Fine Textures	
		Color:	Pearl Milan	
		Pattern:		
		Number:		
		Mfr Contact:	Don & Kimberly Myrick, Hartman LTD, Inc. (206) 842-1846	
	DP-3	Manufacturer:	Lumicor	Rooms 1065, 1026 waiting area floor to ceiling
		Style:	Botanicals	
		Pattern:	Wood Ribbon	
		Number:	AW-836-101-AH	
		Mfr Contact:	Don & Kimberly Myrick, Hartman LTD, Inc. (206) 842-1846	
	DP-4	Manufacturer:	Lightblocks or 3Form	Nurse Stations at Floors 2 & 3
		Color:	Clear	
Edge Banding 12 32 16	EB-1	Manufacturer:	Doellken-Woodtape	To Be Used With All Laminate Work Surfaces & Cabinets (Except 2nd & 3rd Floor Colored Exam Rooms & Nurse Stations)
		Number:	4125	
		Color:	Hardrock Maple	
		Mfr Contact:	1-800-461-0061	
	EB-2	Manufacturer:	Doellken-Woodtape	To Be Used With PL-3 at Floors 1, 2, 3, 4
		Number:	2116	
		Color:	Light Beige	
Fiber Reinforced Laminate 06 83 00	FRL-1	Manufacturer:	Pionite	Floors 1, 2, 3, and 4 1/2-height walls, N.S.desk fronts, exam room chairs walls, exam room N.S.. desk front (with SS-1), MB Bench Wall
		Number:	WM-791	
		Color:	Hard Rock Maple, Suede	
		Mfr Contact:	Shanna Ross (425) 308-3658	
	FRL-2	Manufacturer:	Pionite	Adult & MB Exam Rooms, Below Sinks at Floors 2 & 3
		Number:	SV-173	
		Color:	Surfin' USA, Suede	
		Mfr Contact:	Shanna Ross (425) 308-3658	
Fluid-Applied Flooring 09 67 00	FAF-1	Manufacturer:	Stonhard	[---]
		Thickness:	3/16-in Nominal	
		Color:		
		Mfr Contact:		

SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Flush Wood Doors 08 14 16	FWD-1	Species:	Plain Sliced [insert]	Solid Core Doors For Transparent Finish
	FWD-2	Species:		Solid Core Doors With Plastic Laminate Faces
	FWD-3	Species:		Solid Core Doors for Opaque Finish
ICU/CCU Manual Operation Doors 08 42 43	ICU-1	Material:	Aluminum	[---]
		Finish:	Clear Anodized	
		Glass:	1/4 in tempered, clear	
Luminous Ceiling Images 09 54 16	LI-1	Manufacturer:		
		Image Number::		
		Image Name:		
		Size:		
		Mfr Contact:		
Paint 09 91 00	P-1	Manufacturer:	ICI	General wall paint & Trim Paint at Floors 1, 2, 3, and 4
		Number:	673	
		Color:	Barrister White	
		Master Palette:	30YY 80/088	
		Leaf:	148	
		Mfr Contact:	Stan Osborne (206) 474-5165	
	EP-1	Manufacturer:	ICI	General Wall Epoxy Paint Wet Area at Floors 1, 2, 3, and 4
		Number:	673	
		Color:	Barrister White	
		Master Palette:	30 YY 80/088	
		Leaf:	148	
		Mfr Contact:		
	P-2	Manufacturer:	ICI	Accent paint infusion pods 4014, 4013, 4029, 4028
		Number:	464	
		Color:	Brown Bag	
		Master Palette:	10YY 35/196	
		Leaf:	146	
		Mfr Contact:		
	EP-2	Manufacturer:	ICI	Patient bath - 3 Walls 4012, 4027
		Number:	464	
		Color:	Brown Bag	
		Master Palette:	10YY 35/196	
		Leaf:	146	
		Mfr Contact:		
	P-3	Manufacturer:	ICI	Paint Infusion Pods, 4015, 4016, 4035, 4034
		Number:	879	
		Color:	Thyme	
		Master Palette:	70YY 46/160	
		Leaf:	96	
		Mfr Contact:		

## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Painting 09 91 00	EP-3	Manufacturer:	ICI	Patient bath & Staff - 3 Walls - 4017, 4033, 1012, 1013, 1015, 1064, 1169
		Number:	879	
		Color:	Thyme	
		Master Palette:	70YY 46/160	
		Leaf:	76	
		Mfr Contact:		
	P-4	Manufacturer:	ICI	Paint infusion pods, 4022, 4021, 4062, 4061 Staff Lounge 1011 - Below Chair Rail
		Number:	623	
		Color:	Silver Clamshell	
		Master Palette:	30YY 49/071	
		Leaf:	149	
		Mfr Contact:		
	EP-4	Manufacturer:	ICI	Patient Bath 3 Walls 4021, 4061, 4019, 4037, 4072, 7081, 4101, 4128
		Number:	623	
		Color:	Silver Clamshell	
		Master Palette:	30YY 49/071	
		Leaf:	149	
		Mfr Contact:		
	P-5	Manufacturer:	ICI	Accent paint counseling, acupuncture, massage rooms, 4157, 4158, 4159, below chair rail on N, S, W wall, E wall floor to ceiling - 4th Floor
		Number:	544	
		Color:	Mushroom Cap	
		Master Palette:	20YY 55/151	
		Leaf:	146	
		Mfr Contact:		
	EP-5	Manufacturer:	ICI	Staff & patient Toilet 2nd & 3rd Floors - 3 Walls; Exam Room Patient Toilets - 3 Walls 4072, 4081, 4101, 4128
		Number:	544	
		Color:	Mushroom Cap	
		Master Palette:	20YY 55/151	
		Leaf:	146	
		Mfr Contact:		
	P-6	Manufacturer:	ICI	Nurse Stations 2127, 2125, 3125
		Number:	953	
		Color:	Wales Green	
		Master Palette:	10GY 45/217	
		Leaf:	100	
		Mfr Contact:		
	P-7	Manufacturer:	Parker	Nurse Stations 2116
		Style:	Colorlife	
		Number:	CL2405D	
		Color:	Spellbound	
	P-8	Manufacturer:	ICI	Nurse Stations 2113, 3136, 3138
		Number:	1349	
		Color:	Wilton Blue	
		Master Palette:	50BG 44/094	
		Leaf:	114	
		Mfr Contact:		

## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Painting 09 91 00	P-9	Manufacturer:	ICI	Nurse Stations 2081, 2086, 6039, 3072
		Number:	1212	
		Color:	Mountain Creek	
		Master Palette:	70GG 38/059	
		Leaf:	199	
		Mfr Contact:		
	P-10	Manufacturer:	Parker	Nurse Stations 2078, 3079
		Style:	Colorlife	
		Number:	CL2675D	
		Color:	Mommia	
	P-11	Mfr Contact:		Nurse Stations 2072, 2074
		Manufacturer:	ICI	
		Number:	881	
		Color:	Pale Moss	
		Master Palette:	70YY 52/150	
	EP-12	Leaf:	96	Public Toilets 2nd & 3rd Floors (If Needed)
		Mfr Contact:		
		Manufacturer:	Sherwin Williams	
		Color:	Portabello	
Plastic Laminate 12 32 16	PL-1	Number:	SW6102	Cabinet Face at Floors 1, 2, 3, and 4
		Manufacturer:	Wilsonart	
		Number:	7909-60	
		Color:	Fusion Maple	
		Directional:		
	PL-2	Mfr Contact:	Hazel Galati Cell: (206) 321- 3294 Voice (254) 207- 2402	Office Work Surfaces at Floors 1 & 4
		Manufacturer:	Wilsonart	
		Number:	4853-38	
		Color:	Mission Stone	
	PL-3	Directional:		Soffit panels at upper cabinets, inner shelving, at Floors 1, 2, 3, 4 (Except 2nd & 3rd Floor Colored Exam Rooms & Nurse Stations)
		Mfr Contact:	Hazel Galati Cell: (206) 321- 3294 Voice (254) 207- 2402	
		Manufacturer:	Wilsonart	
		Number:	D436-60	
	PL-4	Color:	Fleece	Exam Room Cabinets Face at Floors 2 & 3
		Directional:		
		Mfr Contact:	Pionite	
		Number:	SV-173	
		Color:	Surfin' USA Suede	
		Mfr Contact:	Shanna Ross (425) 308-3658	

**SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE**

Description	Tag	Product	Data	Remarks
Plastic Laminate 12 32 16	PL-5	Manufacturer:	Pionite	MB Exam Room Benches at Floors 2 & 3
		Number:	WM-791	
		Color:	Hard Rock Maple, Suede	
		Mfr Contact:	Shanna Ross (425) 308-3658	
	PL-6	Manufacturer:	Pionite	MB Exam Room Benches at Floors 2 & 3
		Number:	WM-791	
		Color:	Hard Rock Maple, Suede	
		Mfr Contact:	Shanna Ross (425) 308-3658	
	PL-7	Manufacturer:	Formica	Office Work Surfaces at Floors 2 & 3
		Number:	3695-58	
		Color:	Painted Screen	
		Mfr Contact:	Rebeca Gaudina (206) 999-2775	
Quartz Surface 12 36 41	QS-1	Manufacturer:	Staron	Main reception desk and infusion pod reception desk transaction counters - 1st & 4th Floors; public toilet 4156, 1045, E1118 sink counter
		Item:	Quartz Surface	
		Number:	RB470	
		Color:	Rocky Mountain Brown	
		Mfr Contact:	Don Hill, The Cronin Co. (253) 796-3528 Cell (253) 709-3242	
Resinous Matrix Terrazzo Flooring 09 66 23	RMT-1	Manufacturer:	Dex-O-Tex	[---]
		Thickness:	1/4-in to 3/8-in	
		Color:		
		Mfr Contact:		
Rubber Base 09 65 00	RB-1	Manufacturer:	Roppe	On carpet and wood vinyl floor and Sheet Vinyl at Floors 1 & 2
		Number:	194	
		Color:	Burnt Umber	
		Size:	4"	
		Mfr Contact:		
	RB-2	Manufacturer:	Roppe	On Carpet & Wood Vinyl Tile and Sheet Vinyl at Floors 2 & 3
		Number:	124	
		Color:	Taupe	
		Size:	4"	
		Mfr Contact:		
Rubber Flooring	R-1	Manufacturer:	Nora	
		Style:	Noraplan Mega 3mm	
		Color:	1585 Blue Marble	
		Texture:	Smooth	
Sheet Vinyl	SV-1	Manufacturer:	Johnsonite	Anti-static

## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
09 65 00		Style:	Toro EL	Pharmacy Areas: 4th Floor, RT-1, 1st Floor, RT-2
		Number:	113	
		Color:	Sourdough	
		Width:		
		Welding Rod:		
Sheet Vinyl 09 65 00	SV-2	Mfr Contact:	Michael Carris, Compass Flooring Cell (425) 577-3473	Patient Toilet - Self Cove 6" & Staff Toilet - Self Cove 6" Storage, Utilities at Floors 1 & 4
		Manufacturer:	Mannington	
		Style:	Primus	
		Pattern:	La Costa	
		Number:	ALL129	
		Color:	Fawn	
		Width:	12'	
		Welding Rod:		
	SV-3	Mfr Contact:	Jill Shaw, T And A Supply Cell (206) 310-7504 Office (206) 282-3770 x1102	Utility Rooms 2nd & 3rd Floor Patient Toilets 2083, 2119
		Manufacturer:	Mannington	
		Pattern:	Primus	
		Style:	LaCosta	
		Number:	All126	
		Color:	Taupestone	
	SV-4	Mfr Contact:	Roberta Dillan (206) 714-4443	Anti-Static  CT Room Floors 2 & 3
		Manufacturer:	Tarkett	
		Pattern:	Granite AS	
		Color:	69-792	
		Welding Rod:	3292-767-6	
Solid Surface 06 61 16	SS-1	Mfr Contact:	Mike Carris (425) 577-3473	Exam room sink counters, massage and acupuncture sink counters, exam room N.S. transaction top/front at Floors 1 & 4
		Manufacturer:	Avonite	
		Number:	F1-9144	
		Color:	Palermo, satin	
	SS-2	Mfr Contact:	Bruce Patterson Cell (206) 276-1544, White-wood Dist. 1-800-494-4838	Exam room and massage and acupuncture integral sinks; public toilet 4156- undermounted sink, 4th Floor, 1, 2, 3, 4 Floors use with Avonite Counters
		Manufacturer:	Avonite	
		Number:	F1-8024	
		Color:	Crème, satin	
	SS-3	Mfr Contact:	Bruce Patterson Cell (206) 276-1544, White-wood Dist. 1-800-494-4838	Main entrance reception desk work surface and infusion pod N.S. work surfaces, sink counter and 1/2-height wall top and
		Manufacturer:	Corian	
		Number:		
		Color:	Beige Fieldstone (F)	
		Mfr Contact:	Tanya Walter	



## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Solid Surface 06 61 16	SS-4	Manufacturer: Number: Color: Mfr Contact:	1-888-994-5547 Ext 330	sides, exam room N.S. desk work surface at Floors 1 & 4
			Corian	Infusion pod integral sinks, 1, 2, 3, 4, Floors (Use With Corian Sink Counters)
			Bone (B)	
	SS-5	Manufacturer: Pattern: Color: Number: Mfr Contact:	Avonite	Public Restroom Sink Counters at Floors at Floors 2 & 3
			Studio Collection	
			Autumn Wheat	
			K3-7725	
	SS-6	Manufacturer: Pattern: Color: Number: Mfr Contact:	Bruce Patterson, White Wood Dist. (800) 494-4838	MB & Adult Exam Room Sink Back Splash at Floors 2 & 3
			Avonite	
			Studio Collection	
			Antique Glass	
	SS-7	Manufacturer: Pattern: Color: Number: Mfr Contact:	K3-8455	MB & Adult Exam Room Sink Counter at Floors 2 & 3
			Bruce Patterson, White Wood Dist. (800) 494-4838	
			Avonite	
			Studio Collection	
	SS-8	Manufacturer: Color: Mfr Contact:	Pearl	CT & Control Sink Counter at Floors 2 & 3
			K3-8243, Satin	
			Bruce Patterson, White Wood Dist. (800) 494-4838	
			Corian	
Tackboard 10 11 20	SS-9	Manufacturer: Color: Contact:	Stone Harbor	General & Sink Counter at Floors 2 & 3
			Tanya Walter 1-888-994-5547, x 330	
			Corian	
			Serene Sage	
	SS-10	Manufacturer: Color: Contact:	Tanya Walter 1-888-994-5547, x 330	Use with SV-1 at Floors 2 & 3
			Corian	
			Doeskin	
			Tanya Walter 1-888-994-5547, x 330	
	SS-11	Manufacturer: Pattern: Color: Number: Mfr Contact:	Corian	Nurse Station Work Surfaces at Floors 2 & 3
			Studio Collection	
			Limestone	
			C1-1610, Satin	
	TB-1	Manufacturer: Style: Number: Color: Mfr Contact:	Bruce Patterson, White Wood Dist. (800) 494-4838	Offices 1st & 4th Floors
			Guilford of Maine	
			Spinel	
			3582	
	TB-1	Manufacturer: Style: Number: Color: Mfr Contact:	050 Sandstone	Offices 1st & 4th Floors
			Julie Cantor,	

## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
			Interface Fabrics (206) 527-8797	
Tackboard 10 11 20	TB-2	Manufacturer:	Guilford of Maine	Offices at Floors 2 & 3
		Style:	Tempest	
		Number:	2120	
		Color:	Dragon Fly-020	
		Mfr Contact:	Julie Cantor, Interface Fabrics (206) 527-8797	
	TB-3	Manufacturer:	Carnegie	MB Nurse Station 2nd & 3rd Floor 2127, 2125, 3125
		Style:	Xorel	
		Number:	6615 Flashback	
		Color:	24	
		Mfr Contact:	Julie Cantor, Interface Fabrics (206) 527-8797	
	TB-4	Manufacturer:	Carnegie	MB Nurse Station 2nd Floor 2116
		Style:	Xorel	
		Number:	6427 Meteor	
		Color:	F322	
		Mfr Contact:	Julie Cantor, Interface Fabrics (206) 527-8797	
	TB-5	Manufacturer:	Carnegie	MB Nurse Station 2nd & 3rd Floors 2113, 3136, 3138
		Style:	Xorel	
		Number:	6427 Meteor	
		Color:	F319	
		Mfr Contact:	Julie Cantor, Interface Fabrics (206) 527-8797	
	TB-6	Manufacturer:	Carnegie	TG Nurse Station 2nd & 3rd Floors 2081, 2086, 3069, 3072
		Style:	Xorel	
		Number:	6423 Strie	
		Color:	F122	
		Mfr Contact:	Julie Cantor, Interface Fabrics (206) 527-8797	
	TB-7	Manufacturer:	Carnegie	TG Nurse Station 2nd & 3rd Floors 2078, 3079
		Style:	Xorel	
		Number:	6423 Strie	
		Color:	F115	
		Mfr Contact:	Julie Cantor, Interface Fabrics (206) 527-8797	
	TB-8	Manufacturer:	Carnegie	TG Nurse Station 2nd & 3rd Floors 2072, 2074
		Style:	Xorel	
		Number:	6423 Strie	
		Color:	F116	
		Mfr Contact:	Julie Cantor, Interface Fabrics (206) 527-8797	
Terrazzo	TZ-1	Manufacturer:		Entrance Lobbies, Corridors 2nd & 3rd Floors
		Color:		
		Size:		

SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Tile 09 30 00	T-1	Mfr Contact:		Public toilets – floor 4156, Staff 4155, 1045, E1118
		Manufacturer:	American Olean	
		Style:	Highland Ridge	
		Pattern:	Color Body Porcelain Tile	
		Number:	HR 52	
		Color:	Evergreen	
		Size:	18" x 18"	
		Grout:	Laticrete, 24 Natural Gray	
		Cove Base:	S36C9T	
		Size:	6" x 12"	
		Mfr Contact:	Brenda Wolf (206) 763-5849	
	T-2	Manufacturer:	American Olean	Public toilets – wall 4156, Staff Toilet Wall 4155, 1045, E1118 to Ceiling
		Style:	Highland Ridge	
		Pattern:	Color Body Porcelain Tile	
		Number:	HR 50	
		Color:	Desert	
		Size:	12" x 12"	
		Grout:	Laticrete, 23 Antique White	
		Mfr Contact:		
	T-3	Manufacturer:	American Olean	Public toilets – wall 4156 & Staff Toilet 4155, 1045, E1118 5" Border, Install @ 5'
		Style:	Highland Ridge	
		Pattern:	Color Body Porcelain Tile	
		Number:	HR 60	
		Color:	Desert/Evergreen	
		Size:	15" x 2-1/2", Install two sheets, one on top of the other, for a total height of 5"	
		Grout:	Laticrete, 23 Antique White	
		Mfr Contact:		
	T-4	Manufacturer:	Graniti Fiandre	Donor Wall (1st Floor), Public Restrooms Walls at Floors 2 & 3
		Pattern:	Wave	
		Color:	Crema Eda	
		Number:	D2PF03, D2PF03B	
		Size:	12" x 12"	
		Grout:	Laticrete, 90 Light Pewter	
		Mfr Contact:	Bill Perkins (630) 875-1039	

SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
Tile 09 30 00	T-5	Manufacturer:	Daltile	Tile Floor & Base Cove, Staff & Patient Toilets at Floors 2 & 3
		Pattern:	Valais Colorbody Porcelain	
		Color:	Carmelo VL81	
		Size:	12" x 12"	
		Grout:	Laticrete, 23 Antique White	
		Mfr Contact:	Tom Gannaway (253) 581-1130	
	T-6	Manufacturer:	Daltile	Tile Accent Wall in Staff and Patient Toilets o at Floors 2 & 3
		Pattern:	Valais - Colorbody Porcelain Interlocking Accent VL90	
		Color:	Latte/Carmelo	
		Size:	12" x 14"	
		Grout:	Laticrete, 23 Antique White	
		Mfr Contact:		
	T-7	Manufacturer:	Daltile	Infusion Pods Pateint Toilet; Exam Rooms Patient Toilet - Toilet/Sink Wall - 4th Floor, Staff & Patient Toilets - 1st Floor (See Below)
		Pattern:	Wall	
		Color:	Matte Urban	
		Putty:	0761	
		Size:	6" x 6"	
		Grout:	Laticrete, 23 Antique White	
	T-8	Manufacturer:	American Olean	Staff & Patient Toilets - Floors - 1169, 1064, 1015, 1012, 1013 Infusion Pod Patient Toilets 4012, 4017, 4019, 4029, 4033, 4037 Exam Room Patient Toilet 4072, 4081, 4101, 4128
		Style:	Highland Ridge	
		Pattern:	Color Body Porcelain Tile	
		Number:	HR50	
		Color:	Desert	
		Size:	18" x 18"	
	T-9	Grout:	Laticrete, 23 Antique White	
		Mfr Contact:		
		Manufacturer:	Atlas Concorde	Use Trims To Match
		Style:	Porcelain Tile	
		Pattern:	Milestone	
		Color:	5bx2 Desert Brick (Confirm Color)	
		Size:	12" x 24"	
	T-10	Grout:		
		Mfr Contact:		
		Manufacturer:	Atlas Concorde	Use Trims To Match
		Style:	Porcelain Tile	
		Pattern:	Milestone	
		Color:	5x Desert Rettificato (Confirm Color)	
		Size:	12" x 24"	
	T-11	Grout:		
		Mfr Contact:		
		Manufacturer:	Atlas Concorde	Use Trims To Match
		Style:		
		Pattern:		
		Color:		

## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
		Style:	Porcelain Tile	
		Pattern:	Milestone	
		Color:	3fx2 Desert Fascia (Confirm Color)	
		Size:	6" x 12"	
		Grout:		
		Mfr Contact:		
	T-12	Manufacturer:	Graniti Fiandre	
		Style:		
		Pattern:		
		Color:	Crema Eda	
		Number:	PF0316G	
		Size:	12" x 12"	
		Grout:	Laticrete 90	
		Mfr Contact:		
Glass Tile 09 30 00	GT-1	Manufacturer:	Daltile	Infusion desks decorative border, 6" (goes with P-2) 4013, 4028 (brown), Patient Toilet Toilet/Sink Wall Border 4012, 4027
		Pattern"	Mosaic Tile – Professional Tile Solutions	
		Style:	Maracas Glass	
		Color:	Lake Shore Blend	
		Number:	P665	
		Size:	12" x 12" sheets, install 6" high border	
		Grout:	Laticrete, 23 Antique White	
	GT-2	Manufacturer:	Daltile	Infusion desks decorative border, 6" (goes with P-3) 4016, 4034 (green), Patient Toilet - Toilet/Sink Wall Border 4017, 4033, 1012, 1013, 1015, 1064, 1169
		Pattern"	Mosaic Tile – Professional Tile Solutions	
		Style:	Maracas Glass	
		Color:	Rainforest Blend	
		Number:	P666	
		Size:	12" x 12" sheets, install 6" high, at 5' o.c. on wall	
		Grout:	Laticrete, 23 Antique White	
	GT-3	Manufacturer:	Daltile	Infusion desks decorative border, 6" (goes with P-4) 4021, 4061 (grey), Patient Toilet - Toilet/Sink Wall Border 4019, 4037, Exam Room Patient Toilet/Sink Wall Border, 4128, 4101, 4081, 4072
		Pattern"	Glass Wall Tile	
		Style:	Glass Reflections, Blends	
		Color:	Urban Camouflage	
		Number:	GR R1	
		Size:	12" x 12" sheets, install 6" high	
		Grout:	Laticrete, 23 Antique White	
Upholstered Cushion Fabric 12 52 19	UF-1	Manufacturer:		Rooms 1024, 1025
		Pattern:		
		Style:		
		Color:		
		Mfr Contact:		
	UF-2	Manufacturer:		Rooms 1166, 1167, 1171

SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
		Pattern:		
		Style:		
		Color:		
		Mfr Contact:		
Vinyl Tile 09 65 19	VT-1	Manufacturer:	Mannington	Hall 3097, Locker 3096, Mail 3091, Lounge 3090, Kitchen 3089, Dining 3088, Staff break room, acupuncture, massage rooms 4157, 4158, 4159 1st & 4th Floor, Alt. Choice for Corridors on 2nd & 3rd Floor (If Budget Doesn't Allow Terrazzo)
		Style:	Nature's Path Select Tile	
		Pattern:	Parallels	
		Number:	12205	
		Color:	Beach Grass	
		Size:	18" x 18" (1/4 turned installation in break room)	
		Mfr Contact:	Jill Shaw (206) 310-7504	
	VT-2	Manufacturer:	Mannington	Alt. Choice for Nurse Stations at Floors 2 & 3 (If Budget Doesn't Allow Terrazzo)
		Style:	Nature's Path Select Tile	
		Pattern:	Parallels	
		Number:	12204	
		Color:	Stonewashed	
		Size:	18" x 18"	
		Mfr Contact:	Jill Shaw (206) 310-7504	
Vinyl Coated Fabric Wall Covering 09 72 16	WVC-1	Manufacturer:	JM Lynne	Massage and acupuncture rooms, 4157, 4158, 4159 N, S, W walls above chair rail
		Style:	Tram	
		Number:	J239107	
		Weight:	20 oz.	
		Width:	54"	
		Mfr Contact:	Barbara Bushnell (206) 767-4845	
	WVC-2	Manufacturer:	JM Lynne	Wait 4141A; Sub-wait 4045, Sub-Wait 1026 (E & W Walls), Wait 1165 - N & W Walls Below Chair Rail, Dressing 1171 (W Wall), Dressing 1166, 1167, 1065, 1066, 1067, 1025, 1024 (E Wall)
		Style:	Bacara Mesh	
		Number:	J221014	
		Weight:	20 oz.	
		Width:	54"	
		Mfr Contact:		
	WVC-3	Manufacturer:	Maharam	Counseling 4008, 4009, 4018, 4046, 4122, 1043 above chair rail
		Pattern:	Whisk	
		Number:	399020	
		Color:	002 Aspen	
		Type:	II	
		Weight:	20 oz.	
		Width:	54"	
		Repeat:	9"v, 18"h	
		Mfr Contact:	Vicki Zuber (206) 624-2230	
	WVC-4	Manufacturer:	Maharam	Counseling 4008, 4009, 4018, 4046, 4122, 1043 below chair rail; Waiting 1113 & S Walls, Reception 3011 North Wall; Waiting 3020 All Walls
		Pattern:	Whisk	
		Number:	399020	
		Color:	005 Bran	
		Type:	II	
		Weight:	20 oz.	

## SECTION 09 06 10 INTERIOR ARCHITECTURAL COLORS &amp; MATERIALS SCHEDULE

Description	Tag	Product	Data	Remarks
		Width:	54"	
		Repeat:	9"v, 18"h	
		Mfr Contact:	Vicki Zuber (206) 624-2230	
Vinyl Coated Fabric Wall Covering 09 72 16	VWC-5	Manufacturer:	JM Lynne	Quiet Rooms at Floors 2, 3, and Chapel 3018
		Pattern:	Newcastle Silk	
		Number:	J319-106	
		Color:	Lion	
		Type:	II	
		Width:	54"	
		Mfr Contact:	Barbara Bushnell (206) 767-4845	
Vinyl Wood Floor 09 65 00	VWF-1	Manufacturer:	Teknoflor	Corridors, exam rooms (excluding infusion) at Floors 1 and 4
		Number:	73805	
		Color:	Natural Oak	
		Welding Rod:	73805 RW	
		Mfr Contact:	Michele Reid (800) 762-6471 x 5514	
	VWF-2	Manufacturer:	Teknoflor	Corridors, exam rooms (excluding infusion) at Floors 1 and 4
		Number:	52301	
		Color:	Devon Pecan	
		Welding Rod:	52301 RW	
		Mfr Contact:	Michele Reid (800) 762-6471 x 5514	
	VWF-3	Manufacturer:	Teknoflor	Exam Rooms at Floors 2 and 3
		Number:	73803	
		Color:	Traditional Oak	
		Welding Rod:	22	
		Mfr Contact:	Michele Reid (800) 762-6471 x 5514	
Wall Protection 10 26 00	WP-1	Manufacturer:	Acrovyn	To Be Used With P-1 & EP-1 at Floors 1, 2, 3, 4
		Number:	253	
		Color:	Parchment	
		Mfr Contact:	C/S Group (800) 233-8493	
Walk-Off Mat	WM-1	Manufacturer:	Shaw	Entry at Floors 1, 2, 3, 4
		Name:	Welcome, EW24	
		Number:	59410	
		Color:	Beige	
		Color:	10123	
		Contact:	John Spegil (425) 830-8871	





## SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide gypsum board products in accordance with the Contract Documents.
- B. Sound attenuation blankets.
- C. Water-resistant base coat.
- D. Identification of fire-rated partitions.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 50 00 - TEMPORARY FACILITIES & CONTROLS: for dust control and weather protection.
- D. Section 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY: Fire-retardant-treated concealed wood blocking.
- E. Section 07 21 00 - THERMAL INSULATION: Vapor retarders and thermal insulation.
- F. Section 07 84 13 - PENETRATION FIRESTOPPING: Firestopping penetrations in fire-rated partitions and ceiling assemblies.
- G. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Metal framing to receive gypsum board.
- H. Section 09 22 26 - METAL SUSPENSION SYSTEMS (GYPSUM BOARD): Grid suspension and trim for suspended gypsum board ceilings.
- I. Section 09 53 23 - METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES: Grid suspension and trim for drywall adjoining acoustical ceilings.
- J. Section 10 26 00 - WALL PROTECTION: High-impact gypsum board substrate to receive wainscot wall protection.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C475 / C475M, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - 2. ASTM C840, Standard Specification for Application and Finishing of Gypsum Board.
  - 3. ASTM C1178, Standard Specification for Coated Glass-Mat Water-Resistant Gypsum Backing Panel.
  - 4. ASTM C1288, Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.
  - 5. ASTM C1325, Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious backer Units.
  - 6. ASTM C1396, Standard Specification for Gypsum Board.
  - 7. ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials.
- B. Gypsum Association (GA):
  - 1. GA-600, Fire Resistance Design Manual Sound Control.
- C. International Code Council (ICC):
  - 1. International Building Code (IBC), as amended by State of Washington.
- D. Underwriters Laboratory (UL)
  - 1. UL Fire Resistance Design Directory.

#### 1.4 QUALITY ASSURANCE

- A. Fire Resistance Rating: Where gypsum board Work with fire resistance ratings are indicated or required to comply with governing regulations, provide materials and installations identical with those of applicable assemblies which have been tested per ASTM E119 by fire testing laboratories acceptable to authorities having jurisdiction.
  - 1. Provide fire-resistance rated assemblies identical to those indicated by reference to GA File Numbers in GA-600 or to design designations in UL "Fire Resistance Directory" or in listing of other testing and inspecting agencies acceptable to authorities having jurisdiction.

## SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

- B. Codes and Standards: Comply with provisions of following Codes, Specifications and Standards, except as otherwise indicated.
  - 1. Codes and Standards listed under Article 1.3 of this Section.
  - 2. Manufacturer's printed Specifications and recommendations.
- C. Prevention of Mold: Prevention of mold is critical to Owner operations.
  - 1. General purpose gypsum board that becomes wet after installation shall be removed and replaced without additional cost to Owner.
- D. Sound Attenuation Enhanced Partitions:
  - 1. Single source responsibility: At sound attenuation enhanced partitions provide all components for partition assembly from one manufacturer, Quiet Solutions.
  - 2. Components include:
    - a. Non-structural steel studs.
    - b. Gypsum sound attenuation board.
    - c. Putty.
    - d. Sealant.

### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product Specifications and installation instructions for each product including other data as may be required to show compliance with these Specifications. Provide catalog cuts of accessories.

### 1.6 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside, under cover and in manner to keep them dry, protected from the weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging. Stack boards on supported floors in small stacks to avoid overloading floor construction.
- C. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

### 1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing of gypsum drywall to comply with ASTM C840 and with gypsum board manufacturer's recommendations.
- B. Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F. For adhesive attachment of gypsum board and finishing of gypsum board, maintain not less than 50 deg F for 48 hours prior to application and continuously after until fully dried.
- C. Ventilate building spaces as required for drying joint treatment materials. Avoid conditions that result in finishing materials drying too rapidly.

### 1.8 MOCK-UP

- A. Prior to installation of sound attenuation partitions, construct mock-up where directed for testing.
- B. Sound isolation products manufacturer shall provide technical field representative to observe assembly of mock-up, provide recommendations, and verify that installation conforms with manufacturer's recommendations.
- C. Sound isolation products manufacturer technical field representative shall conduct field test of mock-up assembly to verify sound isolation performance.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Gypsum Boards:
  - 1. For non-fire rated and non-proprietary fire-rated assemblies, any ICC-ES approved manufacturer's products may be used.
  - 2. Other Gypsum Board Products: As specified below.

## SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

- B. For proprietary fire-rated systems and all shaft wall assemblies, provide framing and gypsum board products by the same manufacturer.

### 2.2 GYPSUM BOARD PRODUCTS

- A. Gypsum Board for General Use:
  - 1. Interior face layer: ASTM C1396, Type X, with tapered edges, 5/8 inch thick unless otherwise noted.
- B. Gypsum Sheathing: as specified under Section 06 16 00.
- C. Gypsum Backer Board: Coated glas-mat water-resistant, 5/8 inch thick, Type X, complying with ASTM C1178, ASTM C1288, and ASTM C1325.
  - 1. Dens-Shield by Georgia Pacific, [www.gp.com](http://www.gp.com).
- D. Exterior Soffit Board: 5/8 inch thick, Exterior Gypsum Soffit Board by United States Gypsum Co., [www.usg.com](http://www.usg.com) or approved equal.
- E. High Impact Gypsum Board:
  - 1. Type X, 5/8 inch thick, mold resistant.
  - 2. Subject to requirements provide one of the following:
    - a. Hi-Impact Brand XP by National Gypsum, [www.nationalgypsum.com](http://www.nationalgypsum.com).
    - b. DensArmor Plus Abuse Guard by Georgia Pacific, [www.gp.com](http://www.gp.com).
    - c. Fiberock Aqua-Tough by United States Gypsum Co., [www.usg.com](http://www.usg.com).
- F. Glas-Mat Gypsum Board: Type X, 5/8 inch thick, mold resistant.
  - 1. DensArmor Plus by Georgia Pacific, [www.gp.com](http://www.gp.com).
- G. Gypsum Shaftliner Board: ASTM C1396 and ASTM C1658, Type X, 1-inch thick.
  - 1. Dens-Glass Ultra Shaftliner, Georgia-Pacific, [www.gp.com](http://www.gp.com).
  - 2. No substitutions.
- H. Gypsum Sound Attenuation Board: Type X, 5/8 inch thick, mold resistant.
  - 1. QuietRock DensArmor Plus 528 and 530 by Quiet Solution, [www.quietsolution.com](http://www.quietsolution.com).

### 2.3 TRIM ACCESSORIES

- A. Accessories: Manufacturer's numbers are listed as a basis of design. Install in one piece when manufactured in the length required.
  - 1. Corner reinforcement: Beadex, Style B-1 and B-2.
  - 2. Metal edge trim: Beadex, Style B-4.
  - 3. Control joint: Amico control joint.

### 2.4 JOINT REINFORCEMENT MATERIALS

- A. General: Except as otherwise indicated, comply with ASTM C475.
  - 1. Joint tape: Paper or fiberglass reinforcing tape.
  - 2. Joint compound: Chemical hardening type for bedding and filling and for exterior use. Ready-mixed vinyl-type or vinyl-type powder for topping on interior uses.

### 2.5 SHAFT WALL SYSTEM

- A. Manufacture: Proprietary UL listed and/or ICC-ES approved system with hourly ratings as shown. Furnish all components from the manufacturer as per UL or ICC-ES listing.
- B. Framing Members: C-H and E type galvanized studs unless otherwise indicated. Provide in mil thicknesses indicated, if not indicated, size studs per manufacturer's load table for 1/240 deflection at 10 pounds per square foot sustained pressure.
  - 1. Provide "J" runners in same thickness as studs at top and bottom of framing.
  - 2. Provide 33 mil "J" runners with 3 inch vertical leg at all door jambs.
  - 3. Stud widths: 4 inches, unless other noted.
- C. Shaft Liner: As specified in this Section.

### 2.6 MISCELLANEOUS MATERIALS

- A. Laminating Adhesive: Of type specifically recommended by gypsum board manufacturer for adhesive application.
- B. Concealed Acoustical Sealant: Provide one of the following:
  - 1. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
  - 2. U. S. Gypsum Co.; SHEETROCK Acoustical Sealant.
  - 3. Ohio Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.

## SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

- 4. Pecora Corp.; BA-98.
- 5. Tremco, Inc.; Tremco Acoustical Sealant.
- C. Sound Attenuation Blankets: U.S. Gypsum "Thermafiber" SA blankets, 2 inch thick or 3-1/2 inch thick glass fiber insulation.
- D. Special Metal Fabrications:
  - 1. Universal window wall anchors: Form 68 mil (14 gauge) galvanized steel J-shape for general interior use at exterior walls. Form to profile shown on Drawings. "Anchor" shall be continuous where shown.
  - 2. 54 mil galvanized sheet steel formed glass stops at tops of glass walls.
  - 3. 43 mil galvanized zees 1 x 1 x 1 inch for offset attachment of stud tracks to fire-proofed beams.
  - 4. "J" and zee 18 mil galvanized sheet steel formed to shapes shown or described.
- E. Grout for Metal Door Frames: Mill mixed vermiculite fireproofing plaster, U.S. Gypsum "Structo-Lite" or equal.
- F. Metal Control Joint:
  - 1. Model No. 93 by Amico. [www.amico-lath.com](http://www.amico-lath.com).
- G. Weather-Resistant Base Coat for Shaftwalls: Acrylic co-polymer, water-resistant base coat.
  - 1. Acceptable Product & Manufacturer: Dryflex DS420 by Dryvit, [www.dryvit.com](http://www.dryvit.com).
  - 2. Approved Substitution.
  - 3. Where Required: Shaft-side surface of shaft walls, full height of shaft.
- H. Accessories for Sound Attenuation Partitions:
  - 1. For use on partitions scheduled to receive gypsum sound attenuation board.
  - 2. Putty: QuietPutty by Quiet Solution, [www.quietsolution.com](http://www.quietsolution.com).
  - 3. Flexible Sealant: QuietSeal by Quiet Solution, [www.quietsolution.com](http://www.quietsolution.com).

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 GENERAL GYPSUM BASE INSTALLATION REQUIREMENTS

- A. Erection Tolerance: Not more than 1/32-inch offsets between planes of gypsum board faces, and 1/8 inch in 8 feet for plumb, level, warp and bow.
- B. Install sound attenuation blankets as indicated, prior to gypsum board.
- C. Install ceiling boards in the direction and manner which will minimize the number of end-butt joints, and which will avoid end joints in the central area of each ceiling.
- D. Stagger end joints at least 12 inches.
- E. Install gypsum board panels with face side out.
- F. Do not install imperfect, damaged or damp boards.
  - 1. Wet or damp boards shall be subject to rejection as non-compliant Work.
- G. Butt boards together for a light contact at edges and ends with not more than 1/16-inch open space between boards. Do not force into place.
- H. Attach gypsum board to supplementary framing and blocking forming additional support at perimeter of openings, cutouts and other locations.
- I. Where acoustical sealant is indicated, apply two beads of acoustical sealant under each edge of runner tracks.
  - 1. Close off sound-flanking paths around or through the Work, including sealing of partitions above acoustical ceilings, and sealing around electrical boxes and other cutouts.
  - 2. Fill cracks totally with sealant.
- J. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor / roof slabs and decks, cut gypsum board to fit profile formed by coffers, joists and other structural members.
  - 1. Allow for joints to install firestopping sealant on all fire-rated partitions.
- K. Space fasteners in gypsum boards in accordance with referenced Standards, except on fire-rated partitions, space fasteners per referenced UL or GA test number.

## SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

### 3.3 METHODS OF GYPSUM BOARD APPLICATION

- A. Single-Layer Application:
  - 1. On ceilings apply gypsum board prior to wall / partition board application to the greatest extent possible.
  - 2. On partitions / walls apply gypsum board to minimize end joints. Provide sheet lengths which will minimize end joints.
- B. On partitions / walls apply base layer and face layers vertically (parallel) with joints of base layer over supports and face layer joints offset one stud space with base layer joints.
- C. Single-Layer Fastening Methods: Apply gypsum boards to metal framing with screws.
- D. Double-Layer Fastening Methods: Apply base layer of gypsum board and face layer to base layer with screws.
- E. Backer Board: Install gypsum backer board as a base for thin-set interior ceramic wall tile. Install backer board with self-drilling screws at 8 inch centers along all metal studs. Provide 1/8 inch joint between boards and between board and floor.
- F. Laminating to Substrate: Where gypsum board panels are indicated as directly adhered to a substrate (other than studs, joists, furring members or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum board panels until fastening adhesive has set.
- G. Curved Surfaces:
  - 1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12 inch long straight sections at ends of curves and tangent to them.
  - 2. For double-layer construction, fasten base layer to studs with screws 16 inches on center. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches on center.

SCHEDULE OF GYPSUM BOARD PRODUCTS	
Description	Where Required
Gypsum Board for General Use	At all locations not otherwise specified.
Gypsum Backer Board	As substrate to receive tiling. As a required substitute at all locations where gypsum board for general use would otherwise be installed prior to building envelope close-in (excludes shaftliner and high-impact gypsum board locations).
High Impact Gypsum Board	As substrate to receive wainscot wall protection. Corridor walls up to 48 inches above finished floor.
Gypsum Shaftliner	At all shafts.
Water-Resistant Gypsum Board	Not allowed. Use gypsum backer board.
Gypsum Sound Attenuation Board	At sound attenuation enhanced partitions as indicated.

### 3.4 INSTALLATION OF SHAFT WALLS

- A. Provide "cavity shaft wall" as shown consisting of metal runners, studs, shaft liner, gypsum board and fasteners erected and applied in accordance with the shaft wall manufacturer's printed instructions.
  - 1. Provide fireproof assemblies for the hourly rating shown or required and complying with UL listing.
- B. Provide temporary weather protection of shafts prior to installation of shaft liner.
  - 1. Wet shaft liner shall be removed and replaced at no additional cost to Owner.
- C. On floor-supported walls, install shaft wall liner without screws unless specifically required by manufacturer.
- D. Use full length shaft wall liner up to 14 feet in height; on higher walls locate horizontal liner joints in the top and bottom thirds of the wall and stagger the joints.
- E. Provide metal stud backing for all horizontal shaft wall liner joints if required by ICC-ES approval or fire test.
- F. Weather-Resistant Base Coat at Shaft Walls:

## SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

- E. Provide metal stud backing for all horizontal shaft wall liner joints if required by ICC-ES approval or fire test.
- F. Weather-Resistant Base Coat at Shaft Walls:
  - 1. Prior to application, meet environmental conditions specified under Article 1.7 of this Section.
  - 2. Prepare substrate. Surfaces shall be clean, dry and structurally sound.
  - 3. Apply water-resistant base coat to shaft-side surface of installed shaft liner in accordance with manufacturer's written instructions.
  - 4. Temporary weather protection of shaft may be removed after full height of shaft has met curing requirements of water-resistant base coat manufacturer.

### 3.5 INSTALLATION OF TRIM & JOINT REINFORCEMENT

- A. General: Anchor trim accessory flanges as required by mudding, screwing or stapling to substrate in accordance with manufacturer's instructions and recommendations.
- B. Install corner beads at external and internal corners of gypsum board Work.
- C. Install metal edge trim as shown and wherever edge of gypsum boards would otherwise be exposed or terminate at other materials. Provide type with face flanges for embedment in joint compound, except where semi-finishing type is indicated.
- D. Metal Control Joints: Provided where shown and review with Architect proposed locations for all other control joints required but not shown, prior to installation.
  - 1. Partitions: 40 feet on center maximum where partition runs exceed 40 feet. Typically locate joint at one side of door frame and extend into ceiling. Cut gypsum board behind joint and back by double studs.
    - a. Locate joints at vertical and horizontal surfaces of soffits where suspended soffits abut floor mounted partitions.
    - b. Provide horizontal joints in stair walls as shown.
  - 2. Ceilings: Provide where shown. Cut gypsum board behind control joints and back by double framing members.
  - 1. Partitions: At the following locations:
    - a. Where partitions abut structural elements or dissimilar walls or ceilings.
    - b. 30 feet on center maximum where partition run exceeds 30 feet.
    - c. Typically locate joint at one side of door frame and extend into ceiling. Cut gypsum board behind joint and back by double studs.
    - d. Where shown.
  - 2. Soffits: At the following locations:
    - a. 50 feet on center maximum where soffit abuts a structural element, dissimilar wall or partition with perimeter relief.
    - b. 30 feet on center maximum where soffit abuts a structural element, dissimilar wall or partition without perimeter relief.
    - c. 30 feet on center maximum where soffit exceeds 50 feet in either direction.
    - d. Where shown.
  - 3. Suspended Partitions: Provide back-to-back metal trim where suspended soffits or partitions abut floor-mounted partitions.
  - 4. Where resiliently-suspended gypsum board ceilings abut walls and columns, provide metal edge trim to allow ceiling to vibrate independently of walls.
  - 5. Cement Board Finish: Approximately 15 feet on center. Provide back-to-back metal trim with 1/2-inch joints for sealant.
- E. Install joint reinforcement on gypsum board joints (including internal corners) to be covered with joint compound. Comply with manufacturer's recommendations and referenced standards for attachment and embedment of joint reinforcement in joint compound.
  - 1. Provide mesh-type joint reinforcement, except provide paper-type where required to comply with manufacturer's recommendations for type of framing systems used or for installation procedures where rapid drying conditions exist.

## SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

### 3.6 PENETRATIONS

A. Treat through-wall penetrations as follows:

Partition Type	Description
At Fire-Rated Partitions	Seal annular space of through-wall penetrations under the provisions of Section 07 84 13.
At Non-Fire-Rated Smoke Partitions	Where annular space less than 1/2 inch: Seal annular space around penetration with flexible non-fire-rated sealant to prevent passage of smoke, both sides of partition.
	Where annular space greater than 1/2 inch: Apply single layer of gypsum board around penetration such that remaining annular space is less than 1/2 inch. Seal remaining annular space around penetration with flexible non-fire-rated sealant to prevent passage of smoke, both sides of partition.
At All Other Partitions	Same as indicated for non-fire-rated smoke partitions.

### 3.7 FINISHING

- A. General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare for decoration. Prefill open joints and rounded or beveled edges, if any, using specified type of compound.
1. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.
- B. Gypsum Board Finish Levels: Finish surfaces to levels indicated below, according to ASTM C840, for locations indicated:

SCHEDULE OF GYPSUM BOARD FINISHES		
Level	Description	Where Required
1	Embed tape at joints.	Unexposed ceiling plenum areas, concealed areas and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
2	Embed tape and apply separate first coat of joint compound to tape fasteners and trim flanges.	Areas to receive ceramic or stone tile set with organic adhesive.
4	Embed tape and apply separate first, fill and finish coats of joint compound to tape, fasteners and trim flanges.	All surfaces that will be exposed to view or surfaced with thin wallcoverings, unless otherwise indicated.
5	Embed tape and apply separate first, fill and finish coats of joint compound to tape, fasteners and trim flanges, and apply skim coat of joint compound over entire surface.	Accent color walls.

- C. Finish exterior gypsum soffit board using setting-type joint compounds to prefill joints and embed tape, and for first, fill (second) and finish (third) coats, with the last coat being a sandable product. Smooth each coat before joint compound hardens to minimize need for sanding. Sand between coats and after finish coat.

### 3.8 PATCHING & ALTERATION WORK

- A. Existing partitions are gypsum board or metal lath and plaster. Cut and patch existing surfaces in all rooms noted on Finish Schedule to receive new finishes and make existing surfaces match new construction.

SECTION 09 21 00 GYPSUM BOARD ASSEMBLIES

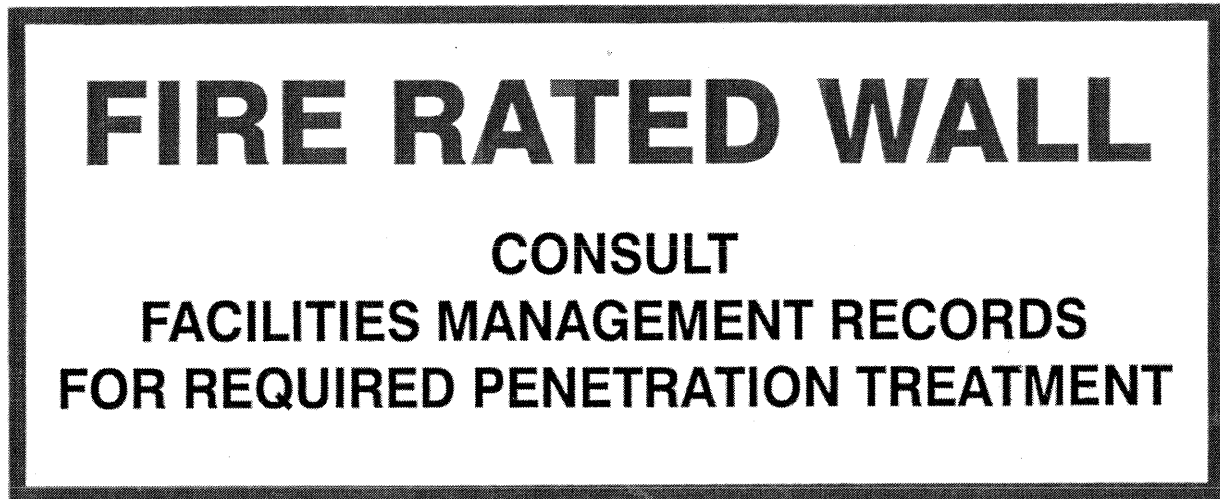
- B. Patch damaged surfaces in existing walls and ceiling as required to match adjacent surfaces.

3.9 CLEAN-UP

- A. Do not allow gypsum board dust and debris to accumulate on floor surfaces. Clean-up and dispose of all gypsum board scraps and dust as soon as Work of this Section is completed in any room or area.
- B. Remove joint compound spillage promptly from door frames, windows and other adjoining Work.
- C. Repair surfaces which have been damaged by finishing Work.

3.10 IDENTIFICATION OF FIRE-RATED PARTITIONS

- A. Provide signage as indicated below in quantity as required.



- B. After partitions have been painted, install identification signage on both sides of all fire-rated partitions.
  - 1. Locate identification signage above finished ceilings and where visible by facility maintenance personnel.
  - 2. Spacing not to exceed 15 feet centers and not less than one per fire-rated partition.

END OF SECTION



## SECTION 09 22 16 NON-STRUCTURAL METAL FRAMING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Non-load-bearing wall framing.
- B. Concealed blocking/backing as required for attaching such items including, but not limited to; handrails, casework, door stops, toilet partitions, toilet accessories, fire protection specialties, window treatments, and ceiling tracks.
- C. Contractor's option: Fire retardant-treated wood blocking may be provided in lieu of metal backing specified herein. See Section 06 10 53.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 50 00 - TEMPORARY FACILITIES & CONTROLS: Dust control.
- D. Section 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY: Fire-retardant-treated concealed wood blocking.
- E. Section 07 21 00 - THERMAL INSULATION: Vapor retarders and thermal insulation.
- F. Section 07 84 13 - PENETRATION FIRESTOPPING: Firestopping penetrations in fire-rated partitions and ceiling assemblies.
- G. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: Installation of gypsum board.
- H. Section 09 53 23 - METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES: Grid suspension and trim for drywall adjoining acoustical ceilings.
- J. Section 09 66 23 - RESINOUS MATRIX TERRAZZO FLOORING: for coordination of installation sequence.
- K. Section 10 14 00 - SIGNAGE: Concealed backing for future interior signage.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM A653 / A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM B117, Standard Practice for Salt Spray (Fog) Apparatus.
  - 3. ASTM C645, Standard Specification for Nonstructural Steel Framing Members.
  - 4. ASTM C653, Standard Guide for Determination of the Thermal Resistance of Low-Density Blanket-Type Mineral Fiber Insulation.
  - 5. ASTM C754, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
  - 6. ASTM C840, Standard Specification for Application of Finishing Gypsum Board.
  - 7. ASTM C954, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033in. (0.84 mm) to 0.12 in. (1.84 mm) in Thickness.
  - 8. ASTM D226, Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- B. American Welding Society (AWS):
  - 1. AWS D1.3, Structural Welding Code - Sheet Steel.
- C. Gypsum Association (GA):
  - 1. GA-600, Fire Resistance Design Manual Sound Control.
- D. International Code Council (ICC):
  - 1. International Building Code (IBC), 2006 Edition as amended by State of Washington.
- E. Steel Stud Manufacturers Association (SSMA)
  - 1. ICBO ER-4943P, Product Technical Information.
- F. Underwriters Laboratory (UL)
  - 1. UL Fire Resistance Design Directory.

#### 1.4 QUALITY ASSURANCE

- A. Fire Resistance Rating: Where gypsum gypsum board Work with fire resistance ratings are indicated or required to comply with governing regulations, provide materials and installations identical with those of applicable assemblies which have been tested per ASTM E119 by fire testing laboratories acceptable to authorities having jurisdiction.

## SECTION 09 22 16 NON-STRUCTURAL METAL FRAMING

1. Provide fire-resistance rated assemblies identical to those indicated by reference to GA File Numbers in GA-600 or to design designations in UL "Fire Resistance Directory" or in listing of other testing and inspecting agencies acceptable to authorities having jurisdiction.
  - B. Welding: Qualify procedures and personnel according to AWS D1.3.
  - C. Codes and Standards: Comply with provisions of following Codes, Specifications and Standards, except as otherwise indicated.
    1. International Building Code, 2006 Edition.
    2. Manufacturer's printed specifications and recommendations.
    3. ASTM C645
    4. ASTM A653 / A 653M.
    5. ASTM C754.
    6. ASTM C840.
    7. SSMA Product Technical Information.
    8. AWS D1.3.
- 1.5 SUBMITTALS
- A. Submittal Procedure: See Section 01 33 00.
  - B. Product Data: Submit manufacturer's product Specifications and installation instructions for each component of gypsum drywall and framing systems including other data as may be required to show compliance with these Specifications. Provide catalog cuts of accessories.
- 1.6 DELIVERY, STORAGE & HANDLING
- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer of supplier.
  - B. Store materials inside, under cover and in manner to keep them dry, protected from the weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging. Stack boards on supported floors in small stacks to avoid overloading floor construction.
  - C. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.
- 1.7 SEQUENCE & COORDINATION
- A. Work of this Section is affected by need to coordinate installation sequence with Work of other selected trades.
  - B. Selected portions of Work of Section 09 66 23 must be installed prior to Work of this Section, in spaces to receive resinous matrix terrazzo flooring, as described in Section 09 66 23.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Metal Framing and Gypsum Boards: For non-fire-rated and generic fire-rated assemblies, any ICC-ES approved manufacturer's products may be used. For proprietary fire-rated systems and all shaft wall assemblies, provide framing and gypsum board products by same manufacturer.

### 2.2 METAL FRAMING MATERIALS

- A. Exterior Enclosure Framing Materials: As specified in Section 05 41 00.
- B. Interior Wall / Partition Framing Materials:
  1. Studs: ASTM C645:
    - a. Provide studs in mil thicknesses as indicated. If not indicated provide studs as required to comply with ASTM C754 or manufacturer's load tables for maximum deflection of L/240 at 5 pounds per square foot.
    - b. Provide 33 mil studs at wall corners and partition ends where corner guards are indicated.
    - c. Acoustically enhanced studs: QuiteRock UltraSteel 527 by Quiet Solutions, [www.quietsolutions.com](http://www.quietsolutions.com). Size as indicated on Drawings.

## SECTION 09 22 16 NON-STRUCTURAL METAL FRAMING

2. Depth of section: As indicated on Drawings.
  3. Floor runners: Match stud widths; provide runners with minimum 1-1/4 inch depth for floor support of studs and for vertical abutment of gypsum board Work to other Work.
  4. Deflection track: Provide one of the following types:
    - a. "SLP-TRK" by SlipTrack Systems, is basis of design.
    - b. "Fire Trak" by Fire Track Corp., is approved equal.
  5. Furring channels: ASTM C645, 7/8 inch deep, 18 mil minimum thickness of base metal hat-shaped.
  6. Zee furring: Dietrich or equal vertically slotted, depth as indicated, 18 mil and 33 mil thickness.
  7. Alignment channels: 1-1/2 inch cold-rolled as specified for ceiling suspension.
  8. Corner angles: 18 mil galvanized formed angles.
  9. Resilient Channels.
- C. Screws:
1. For gypsum base: Self-drilling cadmium-plated bugle head screws.
  2. For studs to runners: Self-drilling, 3/8 inch pan head (S-12) or Tek screws.
- D. Metal Backing and Reinforcement: Provide backing for all items required to be attached to gypsum board surfaces unless studs are provided for the attachment. Backing heavier than 20 gauge (33 mils) shall not protrude past the plane of the stud flanges. Provide heavier gauge studs where indicated.
1. Grab bars: Provide 12 gauge steel backing plates welded or screwed to 33 mil metal studs.
  2. All surface mounted toilet accessories, wall mounted light fixtures, wall mounted cabinets, countertop cleats, hanging rails and other such items: Provide 20 gauge (33 mils) galvanized sheet metal 6 inch wide pop riveted to face of studs, with two rivets per stud.
  3. Vertical shelf standards: Locate 33 mil thickness additional studs installed with web directly behind vertical standards.
  4. Wall-mounted televisions and monitor brackets: Two 54 mil thickness studs.
- E. Expansion Anchors: Hilti "Kwik Bolt", Ramset Redhead "Trubolt Wedge" or equivalent.
- F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type specified, and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E1190 conducted by a qualified testing agency.

### 2.3 SHAFT WALL SYSTEM

- A. Manufacture: Proprietary UL-listed and/or ICC-ES approved system with hourly ratings as shown. Furnish all components from the manufacturer as per UL or ICC-ES listing.
- B. Framing Members: C-H and E type galvanized studs unless otherwise indicated. Provide in mil thicknesses indicated, if not indicated, size studs per manufacturer's load table for 1/240 deflection at 10 pounds per square foot sustained pressure.
1. Provide "J" runners in same thickness as studs at top and bottom of framing.
  2. Provide 33 mil "J" runners with 3 inch vertical leg at all door jambs.
  3. Stud widths: 4 inches, unless other noted.

### 2.4 MISCELLANEOUS MATERIALS

- A. Special Metal Fabrications:
1. Universal window wall anchors: Form 14 gauge (68 mil) galvanized steel "J" shape for general interior use at exterior walls. Form to match existing profile. "Anchor" shall be continuous.
  2. 54 mil galvanized sheet steel formed glass stops at tops of glass walls.
  3. 43 mil galvanized zeeks 1" x 1" x 1" for offset attachment of stud tracks to fire-proofed beams.
  4. "J" and zee 18 mil galvanized sheet steel formed to shapes shown or described.
- B. Grout for Metal Door Frames: Mill mixed vermiculite fireproofing plaster, U.S. Gypsum "Structo-Lite" or equal.

## SECTION 09 22 16 NON-STRUCTURAL METAL FRAMING

- C. Isolation Strip at Exterior Walls:
  - 1. Asphalt-saturated organic felt: ASTM D 226, Type I (No. 15 asphalt felt), non-perforated.
  - 2. Self-adhering flexible flashing: "Blueskin" by The Henry Co. or equivalent.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION FOR METAL FRAMING SYSTEMS

- A. Ceiling Anchorages: Provide hangers and inserts necessary to support suspended ceiling below concrete slabs before concrete is poured and in time to avoid delay in work. Give particular attention to the correct location and alignment of hangers and inserts.
- B. Before sprayed-on fireproofing is applied, attach clips, runners, end studs or ceiling runners to surfaces indicated to receive sprayed-on fireproofing.
  - 1. Where partition track will not have sufficient contact with bottom of steel beams, provide steel offset zees attached to beams with powder actuated anchors at 24 inches on center.
- C. After sprayed-on fireproofing has been applied, remove fireproofing as needed to complete installation of gypsum drywall assemblies with framing in direct contact with structure. Protect remaining fireproofing from damage.
- D. Sound deadening of steel door frames. Use one of the following methods:
  - 1. Spot grout metal door frame anchors with specified plaster prior to erection.
  - 2. Fill door jambs solid with acoustical insulation prior to erection.

#### 3.3 INSTALLATION OF METAL FRAMING SYSTEMS

- A. Metal Framing Installation: As per specified Standards, Structural Drawings and as modified herein.
- B. Do not bridge control joints with framing system, frame both sides of joints with framing members.
- C. Install isolation strips between metal framing and exterior concrete and masonry walls.

#### 3.4 CEILING SUPPORT SUSPENSION SYSTEMS

- A. Secure hangers to structural supports by connecting directly to structure where possible, otherwise connect to inserts, clips or other anchorage devices or fasteners as indicated. Where large ducts or similar obstructions preclude hanger wires at normal spacing, provide metal framing to trapeze the obstructions. Do not support ceilings off piping or ductwork.
- B. Space main runners 4'-0" on center and space hangers 4'-0" on center along runners, except as otherwise shown.
- C. Level main runners to a tolerance of 1/8 inch in 12'-0" measured both lengthwise on each runner and transversely between parallel runners.
- D. Space furring members or cross tees 24 inches on center, except as otherwise indicated.
- E. Install auxiliary framing at termination of gypsum drywall work, and at openings for light fixtures and similar work, as required for support of both gypsum board and other Work indicated for support thereon.

#### 3.5 INTERIOR WALL / PARTITION FRAMING SYSTEMS

- A. Install work free of contact with or attachment to mechanical ducts, pipes, distribution boxes or their insulation. In full height and fire rated partitions, provide framing around ducts with headers and studs to provide 1 inch clearance around ducts.
- B. Frame all partitions scheduled to receive gypsum sound attenuation board using acoustically enhanced metal studs.

## SECTION 09 22 16 NON-STRUCTURAL METAL FRAMING

- C. Partition framing: Install studs vertically into floor and ceiling runners 16 inches on center unless otherwise shown. Anchor studs to bottom runners with screws when located adjacent to metal door frames, partition intersections and corners. Provide cut to length studs between top of framed openings and ceiling runners at required spacings. Provide additional framing and blocking as required to support gypsum board at openings and to support built-in items and attached fixtures. Cut studs 5/8 inch short of the ceiling runner webs on full height partitions, and attach studs to the ceiling tracks only where slotted deflection tracks are used. The ceiling runners shall function as deflection channels.
  - 1. For fire-resistance-rated and STC-rated partitions that extend to the underside of floor / roof slabs and decks or other continuous solid-structure surfaces to obtain ratings, install deflection tracks and supplemental framing around structural and other members extending below floor / roof slabs and decks, as needed to support gypsum board closures and to make partitions continuous from floor to underside of solid structure. Screw studs to deflection tracks.
- D. Framing at Door Openings: Install double studs of thicknesses noted below on each side of metal door frames, accurately centered and securely attached to the anchor clips or bottom runners with self-tapping screws. The doubled studs need not be in contact. Screw gypsum board to each of the doubled studs as required for typical studs, to form a stiff box column at each jamb.
  - 1. Doors up to 3 feet wide: Two 18 mil studs.
  - 2. Doors over 3 feet wide: Two 33 mil studs.
- E. Examine Structural and Mechanical Drawings to determine the amount of interference above ceilings and the amount of additional framing that will be required. Offset framing as required and provide additional bracing as necessary to stabilize partitions.
- F. Construct large openings such as sliding door openings with headers and jamb studs per Schedule and Details on Structural Drawings.
- G. Provide diagonal bracing to structure for all non-full height wall framing as indicated on attached detail sheet. Where doors are shown to be ceiling height, provide braces at each jamb.
- H. Chase Walls:
  - 1. Align two parallel rows of floor and ceiling runners and secure as hereinafter specified for partitions.
  - 2. Position metal studs vertically in runners, 24 inches on center.
  - 3. Brace studs with 2-1/2 inch metal studs installed horizontally at 48 inch height or provide 12 inch high gypsum board gussets.
  - 4. Install gypsum board as hereinafter specified for partitions.
- I. At all ceramic tile clad partitions, install corner angles at all interior corners so backer board of adjacent walls is attached to common framing member.

### 3.6 INSTALLATION OF SHAFT WALLS

- A. Provide "cavity shaft wall" as shown consisting of metal runners, studs, shaft liner, gypsum board and fasteners erected and applied in accordance with the shaft wall manufacturer's printed instructions. Provide fireproof assemblies for the hourly rating shown or required and complying with UL listing.
- B. On floor-supported walls, install shaft wall liner without screws unless specifically required by manufacturer. Use full length shaft wall liner up to 14 feet in height; on higher walls locate horizontal liner joints in the top and bottom thirds of the wall and stagger the joints. Provide metal stud backing for all horizontal shaft wall liner joints if required by ICC-ES approval or fire test.

END OF SECTION



## SECTION 09 22 26 METAL SUSPENSION SYSTEMS (GYPSUM BOARD)

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install ceiling suspension system to receive gypsum board as described in the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittals of Product Data and Samples.
- C. Section 09 21 00 - GYSPUM BOARD ASSEMBLIES: Gypsum board.
- D. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING.
- E. Structural Drawings: General Notes - Design Criteria.

#### 1.3 REFERENCES

- A. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7, Minimum Design Loads for Buildings and Other Structures: Section 13.5.6.
- B. ASTM International (ASTM):
  - 1. ASTM A641, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - 2. ASTM C635, Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tiles and Lay-in Panel Ceilings.
  - 3. ASTM C645, Standard Specification for Nonstructural Steel Framing Members.
  - 4. ASTM E1190, Standard Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members.
- C. Steel Stud Manufacturers Association (SSMA):
  - 1. ICBO ER-4943P, Product Technical Information.

#### 1.4 REGULATORY REQUIREMENTS

- A. Meet seismic bracing requirements of Section 13.5.6 of ASCE 7.

### PART 2 - PRODUCTS

#### 2.1 PRE-MANUFACTURED SYSTEMS

- A. Meet requirements of ASTM C635, Heavy Duty.
- B. Manufacturer's standard direct-hung grid suspension system composed of 1-3/8 inch wide main beams and cross furring members that interlock to form a modular supporting network.
  - 1. Wall channels: For attaching grid members to walls.
- C. Hanger wire: ASTM A641, soft, Class 1 galvanized, 8 gauge.
- D. Carrying channels: Cold-rolled steel: 1-1/2 inch deep, 475 pounds per 1,000 feet, protected with rust-inhibitive paint or galvanized.
- E. Steel rigid furring channels: ASTM C645, hat-shaped, depth of 7/8 inch, and minimum 18 mil (uncoated) metal.

#### 2.2 ATTACHMENT DEVICES

- A. Metal Roof Deck Attachment Devices:
  - 1. Wire hanger inserts: For installation in ribs of roof deck prior to roofing.
  - 2. Self-drilling tie-wire screws:
    - a. Drop Ceiling Anchor Screw by ABESCO, Inc.
    - b. Super Deck Screw by Uhahm Manufacturing Co., Ltd.
    - c. DC Series by Construction Materials, Inc.
    - d. Approved equal.
- B. Concrete Structure Attachment Devices:

## SECTION 09 22 26 METAL SUSPENSION SYSTEMS (GYPSUM BOARD)

1. Wire hanger inserts: No. 6 galvanized wire loop and 26 gauge galvanized shell or 14 gauge galvanized steel strap with 5/16 inch hole.
2. Powder-driven anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attachment of hangers, and with capability to sustain, without failure, a load equal to ten times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing laboratory.
  - a. Powder-driven anchors may not be used to attach diagonal bracing.
3. Drilled anchors: One piece tie-wire head for installation into hammer drill holes. One inch embedment into concrete with 100 pound allowable tension load. Ramset "Redi-Drive" or approved equal.
  - a. Use for attaching diagonal bracing and optional for hanger wires.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 SUSPENSION SYSTEMS - GENERAL

- A. Secure hangers to structural supports by connecting directly to structure where possible, otherwise connect to inserts, clips or other anchorage devices or fasteners as indicated.
- B. Where large ducts or similar obstructions preclude hanger wires at normal spacing, provide additional metal framing to trapeze the obstructions.
- C. Level assembly within 1/8 inch in 12 feet.
  1. Do not make local kinks or bends in hanger wires as a means of leveling assembly.

#### 3.3 PRE-MANUFACTURED SYSTEMS

- A. Follow manufacturer's printed instructions with modifications listed below except where manufacturer's printed instructions are more stringent.
  1. Meet requirements of Article 3.2 above.
  2. Space main runners 4 feet on center maximum.
  3. Space hanger wires 4 feet on center maximum, except as otherwise indicated.
  4. Space metal furring tees at 2 feet on center maximum, except as otherwise indicated.
  5. Install auxiliary framing at termination of gypsum board Work, and at openings for light fixtures and similar Work, as required for support of both gypsum board and other Work indicated for support thereon.

END OF SECTION



## SECTION 09 29 00 GLASS FIBER REINFORCED GYPSUM

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Interior glass fiber reinforced gypsum column covers. (GRG)

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions, and Division 01 apply to Work of this Section.
- B. Section 07 92 00: JOINT SEALANTS.
- C. Section 09 21 00: GYPSUM BOARD ASSEMBLIES: for finishing of GRG column covers.
- D. Section 09 91 00: PAINTING: for painting.

#### 1.3 REFERENCES

- A. Glass Reinforced Gypsum Guide by CISCA Levels of Gypsum Board Finish

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's detailed technical data for material and fabrication, including catalog cuts of anchors, hardware, fastenings, and related accessories.
- C. Shop Drawings: Submit shop drawings for fabrication and erection of GRG components, and installation for anchorage devices. Indicate material, construction, dimensions, locations, tolerances, installation, and connection details.

#### 1.5 QUALITY ASSURANCE

- A. Quality Control: Each component must be clearly stamped by the manufacturers quality control inspector.

#### 1.6 DELIVERY, STORAGE & HANDLING

- A. Deliver material in undamaged condition and store in interior dry area free from moisture. Keep material in manufacturer's original crate until ready to install. In the event of freight damage, note freight bill and contact manufacturer immediately.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURER

- A. Subject to compliance with requirements. Provide products from one of the following:
  - 1. PLASTRGLAS, INC., [www.plasterglas.com](http://www.plasterglas.com).  
4200 N. 30TH STREET  
OMAHA, NE 68111  
Phone: (402) 455-0652 Fax: (402) 451-5375
  - 2. PLASTERFORM, INC., [www.plasterform.com](http://www.plasterform.com).

#### 2.2 MATERIALS

- A. General: Provide materials selected for surface smoothness with out pitting, seam marks, stains, and other imperfections on finished units.
- B. Anchorage and Fasteners: Manufacturers standard for fastening and alignment of part-to-part connections.
- C. Adhesives: Solvent base type, suitable for gypsum wallboard applications. Similar or equal to Liquid Nails, PL400, PL Premium or equal.
- D. Embedment: Cold rolled galvanized channel or Styrofoam Bead Board is acceptable for reinforcing. Use of wood or metal at attachment points not acceptable.

#### 2.3 FABRICATION

- A. General: Furnish GRG Components and as indicated on Contract Documents, unless otherwise indicated. Furnish units with custom shapes, brackets, and attachment hardware as required.
- B. GRG Components: Prefabricated glass-fiber reinforced gypsum units using multidirectional spray lay-up procedures and combined with gypsum plaster formulated for combination with glass fiber. NO HAND LAY-UP METHOD WILL BE ACCEPTED.

## SECTION 09 29 00 GLASS FIBER REINFORCED GYPSUM

- C. Shell thickness: 3/16" nominal.
- D. Minimum weight: 2 lbs/ft<sup>2</sup>.
- E. Non-combustible material with primer ready surface.
- F. Pinholes and mold voids filled and over-spray trimmed.

### 2.4 PHYSICAL PROPERTIES OF GRG SHAPES

- A. Matrix: Gypsum Cement.
- B. Glass Fiber: 5-6% by weight, Type E 38 % by volume.
- C. Thickness: 3/16" Nominal.
- D. Flexural Strength (ASTM C580): 10,660 PSI.
- E. Modulus of Elasticity: 1.43 x 10<sup>6</sup> psi.
- F. Ultimate Tensile Strength (ASTM D638): 2,250 psi.
- G. Modulus of Elasticity: 3.87 x 10<sup>6</sup> psi.
- H. Flammability (ASTM E84): Flame Spread Index -0.  
Smoke Developed Value -0.  
Fuel Contributed -0.
- I. Impact Strength (ASTM D256): 12.9 ft lb/in.
- J. Thermal Conductivity (ASTM C518): "C" of 1.56 BTU/hr ft<sup>2</sup> °F.
- K. Barcol Hardness (ASTM D2583): 64.
- L. Rockwell Hardness (ASTM D785): 98.8 'M' Scale.
- M. Density: 106.4 lbs/ft<sup>3</sup>.
- N. Thermal Coefficient of Expansion (ASTM D696): 5.4 x 10<sup>6</sup> in/in/°F.
- O. Compressive Strength (ASTM C39/C109): 7,080 psi.
- P. Water Resistance (ASTM C473): 12.5% Weight Gain.
- Q. Humidified Deflection (ASTM C473): 1/8".
- R. Toxicity NBS/U.S. Testing: Non-Toxic.
- S. Mold Construction: Molds to be made of fiberglass to insure dimensional accuracy, resulting in a smooth finished product conforming to profiles indicated. NO wood or metal molds will be accepted for part production.
- T. Matrix: Combine glass fiber and matrix slurry at a constant rate to achieve desired mix proportions and glass content. Spray in accordance with manufacturers instructions.
- U. Embedments: Embed required inserts in matrix to develop full strengths. Embed only after required 3/16" nominal thickness has been achieved. No embedments will be accepted at connection joints.

### 2.5 FINISH

- A. Surface: GRG Components shall be free of scratches and blemishes.

## PART 3 – EXECUTION

### 3.1 PREPARATION

- A. Inspect adjacent construction for conditions that would prevent proper installation of reinforced gypsum units.

### 3.2 INSTALLATION

- A. Expansion Joints: Expansion joints such as USG 893 shall be installed in runs exceeding 35 feet.
- B. Installation: Install reinforced gypsum units true, plumb and level in accordance with manufacturers installation instructions.
- C. Joint Finishing: Joints between reinforced gypsum units shall be taped and finished in accordance with gypsum board finish manual. Joint shall follow curvature of unit if applicable. Patch and repair surface imperfections due to damage as jobsite. Exercise care in taping and finishing to prevent "crowning". Sand joint smooth after joint finished.

### PART 3.3 FINISHING

- A. Blow unit clean and primer before painting.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Ceramic, stone and glass tile on floors and walls as described in the Contract Documents.
- B. Tile accessories.

1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of product data and samples.
- C. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Submittal of maintenance data.
- D. Section 03 35 10 - CONCRETE FLOOR SLAB PREPARATION: for preparation of concrete floor slab.
- D. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected patterns and colors.
- E. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES: Gypsum backer board behind ceramic wall tile.

1.3 REFERENCES

- A. American National Standards Institute (ANSI)
  - 1. ANSI A108.5, Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
  - 2. ANSI A108.6, Chemical Resistant, Water Cleanable Tile-setting and Grouting Epoxy.
  - 3. ANSI A118.4, Latex-Portland Cement Mortar.
  - 4. ANSI A136.1, Specifications for Organic Adhesives for Installation of Ceramic Tile.
- B. Tile Council of North America (TCNA)
  - 1. Handbook for Ceramic Tile Installation.

1.4 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: An alternate method to the Uniform Plumbing Code requirement for shower pans has been approved by the Tacoma Building and Land Use Services Division.
  - 1. The alternate method consists of a proprietary system of waterproof membrane and latex Portland Cement thin-set mortar. The Laticrete system specified herein formed the basis of the Plumbing Code Appeal.
  - 2. No Substitutions are allowed.
- B. Standards: Except as modified by governing Codes and by the Contract Documents, comply with applicable provisions and recommendations of the referenced Standards listed under Article 1.3 above.

1.5 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Product Data: Submit manufacturer's technical information and installation instructions for all materials required.
- C. Samples for Verification: Submit a minimum of 2 tiles of each color, 2 complete sets of grout manufacturer's grout sticks and 2 sets of color chips of silicone sealant for color coordination and verification. One set of tiles will be returned.

1.6 WARRANTY

- A. Manufacturer's warranty for patient room toilet / shower floor and wall tile to be watertight for two (2) years after date of Final Acceptance. Repair all leaks resulting from improper workmanship including materials and surfaces damaged by those leaks.

PART 2 - PRODUCTS

2.1 CERAMIC & STONE TILES

- A. Ceramic and stone tiles: As scheduled in Section 09 06 10.

2.2 EPOXY GROUT

- A. Water cleanable 100 percent solids epoxy, 2-component, conforming to ANSI A118.3, available in a minimum of 15 colors for color selection. Acceptable products:
  1. Latapoxy SP-100 by Laticrete.
  2. Kerapoxy by Mapei.
  3. Color-Poxy by Hydroment.

2.3 STANDARD CEMENT GROUT

- A. Factory-prepared mix.
  1. Provide sanded cement grout for joints 1/8 inch or greater.
  2. Provide unsanded cement grout if some joints will be less than 1/8 inch wide.

2.4 TILE CLEANERS

- A. Neutral base commercial tile cleaner as approved by grout and tile manufacturers.

2.5 WATERPROOFING MEMBRANE

- A. Acceptable product: Laticrete International, Inc., No. 9235 with fabric reinforcing.

2.6 SILICONE SEALANT

- A. Acceptable product: Dow Corning 790. Color selected from standard and special color selections to be compatible with grout colors.

2.7 TILE SEALER

- A. Acceptable product: Hillyard Chemical Co. No. 341, AquaMix or approved Substitute.

2.8 SETTING MATERIALS

- A. Latex Portland Cement Thin-Set Mortar (Bond Coat): ANSI A118.4 with Laticrete 211 Crete filler powder gauged with Laticrete 4237 latex thin-set mortar additive.
- B. Organic Adhesive: Water resistant, latex adhesive ANSI A136.1, Laticrete No. 15 Multi-Mastic or equal, white color.
- C. Glass Fiber Mesh Tape: As recommended by tile backer board manufacturer.
- D. Trowelable Underlayments and Patching Compound:
  1. Feather Spread by Raco.
  2. SD-F Feather Finish by Ardex.
  3. Approved Substitution.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify concrete substrate for compliance with requirements of Section 03 35 10.
- B. Inspect concrete floor finish for smoothness and proper slope to drain. Concrete substrate must be fully cured. Do not begin Work if substrate condition cannot be corrected by thin-set mortar. **Do not use latex underlayment.**
- C. Inspect metal stud framing. Check that metal angles are installed at all corners so that tile gypsum backer board corners cannot separate.
- D. Inspect gypsum backer board on all walls to receive ceramic tile. Prefill joints around pipes and between boards, and between boards and concrete with glass fiber mesh and tile setting mortar.
- E. Mask adjacent surfaces when installing and grouting tiles at finished walls and countertops. Use nylon or suitable tools to avoid abrading finished surfaces.

## SECTION 09 30 00 TILING

- F. Waterproofing: Install waterproofing under tile in toilet / shower room. Apply liquid membrane with roller and brush in 2 coats as required to achieve dry film thickness recommended by manufacturer. Embed 6-inch wide reinforcing fabric in first coat over all floor cracks, all joints in tile gypsum backer boards and all joints between floor and tile backer boards. Cover fabric with additional application of liquid membrane. Install waterproofing under entire surfaces to be tiled, including threshold.
  - 1. Maintain manufacturer's installation instructions at Project Site and install waterproofing in strict accordance with approved installation instructions.
- G. Fill floor drain recess with cementitious patching mortar and trowel flush with adjacent waterproofed floor. Provide filter fabric around flashing flanges of floor drain to prevent sealing of weepholes.

### 3.2 INSTALLATION

- A. ANSI Tile Installation Standard: Comply with applicable parts of ANSI 108 series of tile installation Standards included under "American National Standard Specifications for the Installation of Ceramic Tile."
- B. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars or covers overlap tile.
- C. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform 1/8 inch joint widths in field wall and floor tiles except at curved surfaces or where varying size tile units are combined.
- D. Where varying tile thicknesses are set on the same substrate, adjust bond coat thickness to align tile faces in same plane.
- E. Grout tile to comply with referenced installation Standards, using grout materials indicated. Mix and install proprietary components to comply with grout manufacturer's directions.
- F. Seal the following joints with silicone sealants:
  - 1. Between metal door frame and wall tile.
  - 2. Between metal door frame and floor tile.
  - 3. Between threshold and floor tile.
  - 4. Between plumbing fixtures and wall and floor tile.
  - 5. Between tile backsplash and countertop.

### 3.3 FLOOR INSTALLATION METHODS

- A. Install floor tile to comply with requirements indicated below for bond coat methods and grout types:
  - 1. Bond coat: Thin-set Latex Portland Cement Mortar on cured or plastic bed, ANSI A108.5 with the requirement that tiles be coated on back side with mortar for 100 percent adhesion.
  - 2. Grout: Water cleanable epoxy.

### 3.4 WALL TILE INSTALLATION METHOD FOR TOILET ROOMS

- A. Install wall tiles in toilet rooms to comply with requirements indicated below:
  - 1. Bond coat: Latex Portland cement mortar: ANSI A108.5 with the requirement that tiles be coated on back side with mortar for 100 percent adhesion.
  - 2. Ceramic tile grout: Water cleanable epoxy.

### 3.5 ACCENT WALL TILE INSTALLATION METHODS

- A. Install wall tiles where backer board is provided outside of toilet rooms.
  - 1. Bond coat: Thin-set Latex Portland Cement Mortar on cured or plastic bed, ANSI A108.5 with the requirement that tiles be coated on back side with mortar for 100 percent adhesion.
  - 2. Grout: Standard cement grout.

SECTION 09 30 00 TILING

3.6 BACKSPLASH INSTALLATION METHOD

- A. Bond Coat: Organic adhesive with 100 percent surface contact.
- B. Grout: Water cleanable epoxy.

3.7 CLEANING & PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all new ceramic tile surfaces with specified tile cleaner so they are free of foreign matter and grout haze.
- B. Remove protective coverings and rinse neutral cleaner from tile surfaces.
- C. Protection: Prohibit foot and wheel traffic from using tiled floors for at least seven (7) days after grouting is completed.
- D. Seal tile in toilet and shower rooms with specified sealer applied in 2 coats in strict accordance per manufacturer's instructions.
- E. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded or otherwise defective tile Work.

END OF SECTION

## SECTION 09 51 00 ACOUSTICAL CEILINGS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install acoustical ceiling panels for suspended acoustical ceilings as described in the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 78 23 - OPERATION & MAINTENANCE DATA: for submittal procedures.
- C. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.
- C. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: for conventional gypsum board suspension system where abuts suspended acoustical ceiling.
- D. Section 09 22 26 - METAL SUSPENSION SYSTEMS (Gypsum Board): for suspended gypsum board ceiling where abuts suspended acoustical ceiling.
- E. Section 09 53 23 - METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES: for suspended acoustical suspension assemblies to receive acoustical ceiling panels.
- F. Division 23 - HEATING, VENTILATING & AIR CONDITIONING: for diffuser mock-up, attachment of diffusers.
- G. Division 26 - ELECTRICAL: for lighting mock-up, attachment of light fixtures.

#### 1.3 QUALITY ASSURANCE

- A. Prior to ordering products, verify that specified lay-in panel edge treatments are compatible with scheduled metal acoustical ceiling suspension systems and accessories such that all lay-in panels seat properly to provide continuous contact with supporting members and wall moldings.
  - 1. If Contractor suspects a potential conflict, submit RFI to Architect requesting review and verification of Project requirements.
  - 2. Order products only after receiving RFI response from Architect.
- B. Coordination of Work: Coordinate layout and installation of acoustical ceiling panels and suspension system components with other Work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, fire suppression system components, if any, and partition systems, if any.

#### 1.4 REGULATORY REQUIREMENTS

- A. Fire Performance Characteristics: Provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Identify fire rated ceiling components with appropriate marking of applicable testing and inspecting agency.
- C. Surface burning characteristics: As follows, tested per ASTM E84.
  - 1. Flame spread: 25 or less.
  - 2. Smoke developed: 50 or less.
- D. Fire resistance ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" or "FM Approval Guide," for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E119.
- E. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.

#### 1.5 SUBMITTALS

- A. Operation & Maintenance Data:
  - 1. Submit manufacturer's product data, product color and pattern selection data, installation, cleaning and maintenance instructions under the provisions of Section 01 78 23.

#### 1.6 MOCK-UP

- A. Provide Mock-up of suspended acoustical ceiling in room jointly agreed upon by Contractor and Architect. Mock-up shall be representative of finished Work in all respects. If satisfactory, Work may be left in place as finished Work.

## SECTION 09 51 00 ACOUSTICAL CEILINGS

- B. Mock-up shall be complete with light fixtures and HVAC diffusers.
- 1.7 DELIVERY, STORAGE & HANDLING
  - A. Store materials where protected from moisture and damage.
  - B. Do not use soiled, scratched or broken material in the Work.
- 1.8 PROJECT CONDITIONS
  - A. Space Enclosure: Do not install acoustical ceilings until space is enclosed, weatherproof, wet-work within space is completed and nominally dry, Work above ceilings is complete and ambient temperature and humidity are continuously maintained near that for Final Occupancy.
- 1.9 MAINTENANCE EXTRA STOCK
  - A. Provide Owner with one unopened carton of each type of lay-in panel for future use. Deliver where directed by Contracting Officer.

### PART 2 - PRODUCTS

- 2.1 MANUFACTURER
  - A. Armstrong is Building Standard, [www.armstrong.com](http://www.armstrong.com).
    - 1. No substitutions.
- 2.2 ACOUSTICAL LAY-IN PANELS & BOARDS
  - A. Product, series, size, edge treatment and color as scheduled in Section 09 06 10.
  - B. Suspension systems: as specified in Section 09 53 23.

### PART 3 - EXECUTION

- 3.1 EXAMINATION
  - A. Inspect for defects in suspension system which are not acceptable.
  - B. Report defects to Architect in writing.
  - C. Do not install lay-in panels until defects in suspension system are corrected.
- 3.2 INSTALLATION
  - A. Materials shall be dry and clean at time of installation.
  - B. Install lay-in panels in accordance with manufacturer's written instructions.
  - C. Install lay-in panels with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.
  - D. Install lay-in panels with pattern running in one direction.
  - E. Cut Tegular Edge Panels: At other than bolt-slot grids, rabbet and paint cut edges of panels to match factory edges.
  - F. Where tegular edge panels are indicated to be oversized in corridors, use 24 x 48 inches acoustical panels cut to size, with rabbeted and painted edges. Use these panels only where required to avoid undersized panels in field of tile.
  - G. Seat all lay-in panels to provide continuous contact with supporting members and wall moldings.
- 3.3 ALTERATION WORK
  - A. Where existing suspended ceilings are altered or repaired under this Contract, match new Work with existing except where new Work is indicated or specified to be different than existing.
  - B. Salvage existing lay-in panels in good condition for re-use.
  - C. Do not replace isolated damaged panels with new panels.
  - D. Install new panels only where large ceiling areas must be replaced.
- 3.4 ADJUSTING & CLEANING
  - A. Touch-up minor abraded surfaces, comply with manufacturer's instructions for cleaning and touch up of minor finish damage.



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- B. Remove and replace Work which cannot be cleaned and repaired to Architect's satisfaction.
- C. Remove from Site all debris connected with Work of this Section.

END OF SECTION



## SECTION 09 53 23 METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install acoustical ceiling suspension assembly to receive acoustical lay-in panels as described in the Contract Documents.
- B. Unistrut substructure, where required.
- C. Deferred Submittal by Contractor.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: for Product Data and Samples and Deferred Submittal procedures.
- C. Section 01 36 00 - DELEGATED DESIGN REQUIREMENTS: for Bidder-design requirements.
- D. Section 01 78 23 - OPERATION & MAINTENANCE DATA: for submittal of operation and maintenance data.
- D. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: for Contractor-option conventional gypsum board suspension system.
- E. Section 09 22 26 - METAL SUSPENSION SYSTEMS (Gypsum Board): for Contractor-option gypsum board suspension system.
- F. Section 09 51 00 - ACOUSTICAL CEILINGS: for acoustical ceiling panels and boards.
- G. Division 23 - HEATING, VENTILATING & AIR CONDITIONING: for diffuser mock-up, attachment of diffusers.
- H. Division 26 - ELECTRICAL: for lighting mock-up, attachment of light fixtures.
- I. Structural Drawings: General Notes - for additional design criteria.

#### 1.3 REFERENCES

- A. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7, Minimum Design Loads for Buildings and Other Structures: Section 13.5.6.
- B. ASTM International (ASTM):
  - 1. ASTM C635, Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
  - 2. ASTM C636/C636M, Standard Practice for Installation of Metal Ceiling Suspension System for Acoustical Tile and Lay-in Panels.
  - 3. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 4. ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 5. ASTM E1190, Standard Test Methods for Strength of Powder-Actuated Fasteners Installed in Structural Members.
- C. ICC Evaluation Service, Inc.
  - 1. ES Report ESR-1308, Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems.

#### 1.4 REGULATORY REQUIREMENTS

- A. Meet seismic bracing requirements of Section 13.5.6 of ASCE 7 or equivalent governing Standard for Project location.
- B. Deferred Submittal: Submit design information for lateral bracing as required by local Building Official to obtain Building Permit.

#### 1.5 DEFINITIONS

- A. Work Point: Point of origin from which to measure for layout of the Work.
- B. CAD: Computer-Aided Drawing(s).

## SECTION 09 53 23 METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES

### 1.6 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Submit as Deferred Submittal, details and reflected ceiling plans of acoustical ceilings before proceeding with Work. Include the following:
  - 1. Location of Work items to be supported by acoustical ceiling suspension system.
  - 2. All work points which control ceiling layout.
  - 3. Locations of all joints in perimeter fascia trim.
  - 4. Ceiling heights.
  - 5. At Contractor's option, he may reproduce Architect's Reflected Ceiling Plans on CAD, and dimension ceiling grid and identify work points.
  - 6. Structural calculations for seismic bracing prepared and stamped by professional engineer licensed in State of Washington.
- C. Operation & Maintenance Manual Data:
  - 1. Product Data: Submit under the provisions of Section 01 78 23, manufacturer's product Specifications and installation instructions for each acoustical ceiling suspension system, for attachments to building structure, and include certified laboratory test reports and other data as required to show compliance with the Contract Documents.

### 1.7 MOCK-UP

- A. Provide mock-up of acoustical ceiling, with bolt-slot grid, in a room within the Project to be jointly agreed upon by Contractor and Architect.
- B. Mock-up shall be representative of finished Work in all respects, complete with light fixtures and HVAC diffusers.
- C. Approved mock-up may be left in place as finished Work.

### 1.8 QUALITY ASSURANCE

- B. Fire Performance Characteristics: Where required provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify fire rated ceiling components with appropriate marking of applicable testing and inspecting agency.
  - 1. Surface burning characteristics: As follows, tested per ASTM E84.
    - a. Flame spread: 25 or less.
    - b. Smoke developed: 50 or less.
  - 2. Fire resistance ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" or "FM Approval Guide," for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.
- C. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other Work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any) and partition systems (if any).

### 1.9 PROJECT CONDITIONS

- A. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, Work above ceilings is complete and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for Final Occupancy.

### 1.10 WARRANTY

- A. Submit under the provisions of Section 01 77 00.
- B. Perimeter Transition System:
  - 1. Manufacturer's standard 10-year written warranty ageing to repair or replace components that fail within Warranty Period. Failures include, but not limited to: rusting and manufacturer's defects.

## SECTION 09 53 23 METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES

2. Warranty Period:
  - a. Perimeter Transition System: 10 years from Date of Substantial Completion.
  - b. Commercial Transition Components, Suspension Systems & Ceiling Products: Manufacturer's standard.

### PART 2 - PRODUCTS

#### 2.1 METAL SUSPENSION SYSTEM

- A. Systems shall meet requirements of ASTM C635.
- B. Heavy duty, exposed direct hung, double web tee design, 9/16 inch exposed face dimension "Bolt Slot" with 1/8-inch reveal.
  1. Basis of Design: Silhouette XL by Armstrong World Industries, [www.armstrong.com](http://www.armstrong.com).
  2. Acceptable Substitutions:
    - a. Fineline DXFF by Donn Industries, [www.usg.com](http://www.usg.com).
    - b. Ultraline 3600 by Chicago Metallic, [www.chicago-metallic.com](http://www.chicago-metallic.com).
- C. Heavy duty, exposed direct hung, double web tee design, 15/16 inch exposed face dimension.
  1. Basis of Design: Prelude XL by Armstrong World Industries, [www.armstrong.com](http://www.armstrong.com).
  2. Acceptable Substitutions:
    - a. DX/DXL by Donn Industries, [www.usg.com](http://www.usg.com).
    - b. Seismic 1200 Series by Chicago Metallic, [www.chicago-metallic.com](http://www.chicago-metallic.com).
- C. Edge Moldings: Metal with finish and face dimension to match main runners.
  1. Includes reverse angle moldings, 15/16-inch and 1-9/16 inches by Armstrong World Industries, [www.armstrong.com](http://www.armstrong.com)
  2. Provide BERC2 beam end retaining clips.
- D. Building Design Standard: Seismic Rx System by Armstrong World Industries, [www.armstrong.com](http://www.armstrong.com).

#### 2.2 ACCESSORIES

- A. Hanger Wire: Galvanized carbon steel wire, ASTM A641, soft temper, prestretched, Class 1 coating, 12 gauge.
- B. Miscellaneous Fascia, Trim & Extensions: Pre-engineered extruded aluminum profiles.
  1. Basis of Design: Armstrong World Industries, [www.armstrong.com](http://www.armstrong.com).
  2. Finish: Factory white (WH) and gun metal grey.
  3. Profiles:
    - a. Axiom - Knife Edge Trim, heights as shown on Drawings.
    - b. Axiom - Classic Trim, heights as shown on Drawings.
    - c. Axiom Building Perimeter System, heights as shown on Drawings.
    - d. Axiom Bottom Drywall Trim, AXBTSTR.
    - e. Axiom T-Bar Connection Clip, AXTBC.
    - f. Axiom Perimeter Pockets, 5 x 5 x 5 inches and 5 x 5 inches with 3/4-inch horizontal flange and extension.
    - g. Axiom Perimeter Closure Clips, size as required.
  4. Provide hanging clips, T-bar connector clips, splice clips and other required accessories to support coves and fascias.

#### 2.3 ATTACHMENT DEVICES

- A. Metal Roof Deck Attachment Devices:
  1. Wire hanger inserts: For installation in ribs of roof deck prior to roofing.
  2. Self-drilling tie-wire screws:
    - a. Drop Ceiling Anchor Screw by ABESCO, Inc.
    - b. Super Deck Screw by Uhahm Manufacturing Co., Ltd.
    - c. DC Series by Construction Materials, Inc.
    - d. Approved equal.

## SECTION 09 53 23 METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES

- B. Concrete Structure Attachment Devices:
  - 1. Wire hanger inserts: No. 6 galvanized wire loop and 26 gauge galvanized shell or 14 gauge galvanized steel strap with 5/16 inch hole.
  - 2. Powder-driven anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attachment of hangers, and with capability to sustain, without failure, a load equal to ten times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing laboratory.
    - a. Powder-driven anchors may not be used to attach diagonal bracing.
  - 3. Drilled anchors: One piece tie-wire head for installation into hammer drill holes. One inch embedment into concrete with 100 pound allowable tension load. Ramset "Redi-Drive" or approved equal.
    - a. Use for attaching diagonal bracing and optional for hanger wires.

### 2.4 SPECIAL CEILING SUPPORT SYSTEMS MATERIALS

- A. Products of one manufacturer.
- B. Approved Manufacturer: Unistrut Corp. [www.unistrut.com](http://www.unistrut.com).
  - 1. Channels: P-1001.
  - 2. Connectors & Bolts: As indicated in manufacturer's current catalog.
  - 3. Closure Strip: P1184 PVC snap-in type.
- C. Where Required:
  - 1. Where necessary to provide substructure to span HVAC ductwork.
  - 2. Suspend only acoustical ceiling suspension system from Unistrut substructure.
  - 3. If other Work is to be suspended from Unistrut substructure, the system shall be Bidder-designed and submitted for Architect review.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Work shall be in accordance with manufacturer's written instructions insofar as they are concerned with the Contract Documents.
- B. Meet requirements of ASTM C636, with hangers supported only from building structural members.
- C. Locate hangers not more than 8 inches from partitions for all tees and spaced 48 inches along each direct-hung runner, unless otherwise indicated.
- D. Ceiling heights indicated on Drawings are to bottom of exposed suspension members.
- E. Lay out suspension system symmetrically about center lines of space unless shown otherwise on Drawings.
- F. Leave suspension system in true plane with straight, even joints.
- G. Suspension system joints shall be straight and in alignment, and exposed surface flush and level.
- H. Wherever abuts walls, columns, and other vertical surfaces, furnish and install appropriate molding.
- I. Provide lateral bracing of suspension system in accordance with approved Deferred Submittal and as required by local Building Official.
- J. Install hangers plumb and free from contact with insulation, piping, ductwork, or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system.
- K. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, counter-splaying or other equally effective means.
- L. Secure wire hangers to ceiling support members and to anchors with three tight turns.
- M. Where obstructions in ceiling plenum preclude direct attachment to structure above, provide trapezes of 1-1/2 inch furring channels, except use nested metal studs of sizes as required where trapeze span exceeds 6 feet.
- N. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical ceiling panels.

SECTION 09 53 23 METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES

1. Attach moldings to substrate at intervals not more than 16 inches on center and not more than 3 inches from ends, leveling with ceiling suspension system to specified tolerance.
  2. Miter corners accurately and connect securely.
  3. Install edge moldings so that tees rest on molding.
- O. Install BERC2 beam end retaining clips on two adjacent walls in accordance with ES Report ESR-1308.
- P. Install perimeter fascia trim as indicated and clip to ceiling suspension members with manufacturer-supplied attachment.
1. Use prefabricated, prefinished corners.
  2. Provide hairline joints at splices.
  3. Pieces less than 36 inches in length are not allowed.
  4. Miter corners accurately for tight joint. Butt joints not acceptable.

SECTION 09 53 23 METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES

3.2 TOLERANCES

- A. Levelness: 1/8 inch in 12 feet.

3.3 ADJUST, CLEAN & REPAIR

- A. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.
- B. Clean exposed surfaces of metal acoustical ceiling suspension assemblies, including trim, edge moldings and suspension members.
- C. Remove and replace Work which cannot be successfully cleaned and repaired to Architect's satisfaction to permanently eliminate evidence of damage.

END OF SECTION



## SECTION 09 54 16. LUMINOUS IMAGE CEILINGS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Light boxes.
- B. Luminous lay-in image tiles.
- C. Wood grip caps.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 09 53 23 – METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES: for ceiling grid to receive Work of this Section and installation.
- C. Section 09 54 16 – LUMINOUS IMAGE CEILINGS.
- D. Division 26 – ELECTRICAL: for on-off switches and power connections and installation of lamps.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C635, Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
  - 2. ASTM C636, Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

#### 1.4 QUALITY ASSURANCE

- A. Comply with Section 01 45 00.
- B. Coordination of Work: Coordinate layout and installation of light boxes and luminous lay-in image tiles with suspension system components and other Work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, fire suppression system components, if any, and partition systems, if any.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit for each type of product specified.
- C. Shop Drawings: Submit drawings showing construction, size and shape of luminous sky-image ceilings, identification of artwork; layout and orientation of image tiles; wiring diagram; programmable controls, and coordination with adjacent work.
- D. Artwork Sample: Submit 3 x 3 inch samples showing quality of graphic reproduction.
- E. Manufacturer's Instructions: Submit manufacturer's installation instructions.
- F. Operation and Maintenance Data:
  - 1. Submit manufacturer's operation and maintenance instructions under the provisions of Section 01 78 23.
  - 2. Submit copy of manufacturer's program for image tile replacement.

#### 1.6 MOCK-UP

- A. Install one luminous sky-image ceiling at location acceptable to Architect. After acceptance, mock-up may remain as part of completed Work.

#### 1.7 DELIVERY, STORAGE & HANDLING

- A. Deliver products in manufacturer's original packaging.
- B. Store materials indoors in location that is secure, dry, and has stable temperature.
- C. Handle in accordance with manufacturer's instructions to prevent damage.
- D. Do not use soiled, scratched or broken material in the Work.

#### 1.8 PROJECT CONDITIONS

- A. Space Enclosure: Do not install acoustical ceilings until space is enclosed, weatherproof, wet-work within space is completed and nominally dry, Work above ceilings is complete and ambient temperature and humidity are continuously maintained near that for Final Occupancy.

## SECTION 09 54 16 LUMINOUS IMAGE CEILINGS

### 1.9 WARRANTY

- A. Comply with Section 01 77 00.
- B. Provide manufacturer's 5 year, pro-rated, limited warranty against visible fade or color shift in image tiles.
- C. Manufacturer shall provide Owner 20 percent discount off price of replacement image tiles purchased after limited warranty expires.

## PART 2 - PRODUCTS

### 2.1 LUMINOUS IMAGE CEILINGS, GENERAL

- A. Acceptable Manufacturer
  - 1. The Sky Factory [www.TheSkyFactory.com](http://www.TheSkyFactory.com)
  - 2. Substitutions: Submit under the provisions of Section 01 25 13.

### 2.2 LIGHT BOXES

- A. Fabricate so back-illumination is distributed uniformly over visible surface of image tiles without fall-off at edges, hot spots, or shadows; image tiles are installable and removable without use of doors, image tiles are fully visible between ceiling suspension grids, and units are installable in 9-inch minimum clearance from face of ceiling suspension grids to structure or other obstructions above. Units shall bear UL label and operate on power characteristics shown on Drawings.
- B. Provide the following types:
  - 1. Dimmable Fluorescent Light Boxes: Fabricate from painted sheet steel. Provide high power factor electronic ballasts dimmable from 0 to 100 percent. Lamps shall be T-5, 6500 K color temperature (daylight balanced), rated for 20,000 hours service life.
    - a. Where Required: Rooms 1028, E1128, and E1129.
  - 2. Radio Frequency Interference (RFI)-Free LED Light Boxes: Lamps shall be light-emitting diode (LED) arrays with 6000 K color temperature (daylight balanced), 100,000 hour estimated service life, and plug-in installation that enables replacement without welding or soldering. Provide power converters, to supply 15 VDC to lamps, for installation as specified in another section.
    - a. Where required: Room 1062.

### 2.3 LUMINOUS LAY-IN IMAGE TILES

- A. Print images on translucent graphic media with high-quality, UV-resistant, pigmented inks.
- B. Laminate images between polycarbonate sheet approved for use in light fixtures and a clear cover film.
- C. Artwork: As scheduled in Section 09 06 10.

### 2.4 WOOD GRIP-CAPS

- A. Provide manufacturer's standard wood trim under ceiling suspension grid members supporting sky-image ceilings.
  - 1. Species: maple.
  - 2. Finish: Stained to match Architect's sample and with satin gloss varnish.
  - 3. Mounting: Embedded magnets.
- B. Where Required: Rooms 1028, E1128, and E1129.

### 2.5 ACCESSORIES

- A. Elevators: Manufacturer's standard aluminum.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Inspect for defects in suspension system which are not acceptable.
- B. Report defects to Architect in writing.

## SECTION 09 54 16 LUMINOUS IMAGE CEILINGS

- C. Do not install luminous lay-in image tiles until defects in suspension system are corrected.

### 3.2 CEILING SUSPENSION GRID

- A. Installed under the provisions of Section 09 53 23.

### 3.3 INSTALLATION OF IMAGE CEILINGS

- A. Install in accordance with manufacturer's written instructions and approved Shop Drawings.
- B. Install elevators and light boxes.
- C. Make connections to power and install lamps as specified in Division 26.
- D. Coordinate installation with building control systems specified in [insert].
- E. Install grid-caps.
- F. Install luminous lay-in image tiles with artwork oriented as shown on approved Shop Drawings.
- G. Repair damage and adjust installation, if required, to provide attractive appearance, provide uniform illumination across face of image tiles, and optimize visual illusion of sky.
- H. Seat all lay-in panels to provide continuous contact with supporting members and wall mouldings.

### 3.4 CLEANING

- A. Clean image tiles and reflective surfaces inside light boxes in accordance with manufacturer's written instructions.
- B. Remove and replace Work which cannot be cleaned and repaired to Architect's satisfaction.
- C. remove from Site debris connected with Work of this Section.

END OF SECTION



PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Sheet Vinyl Flooring.
- B. Vinyl Composition Tile.
- C. Rubber Base.
- D. Trowelable Underlayment.
- E. Primer.
- F. Sealant.
- G. Adhesives.
- H. Integral Cove Base Accessories.
- I. Vinyl Edge Trim.
- J. Maintenance floor sealer is excluded from this Project.

1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 45 10 - VAPOR EMISSION & ALKALINITY TESTING: Testing of concrete slab substrates.
- D. Section 01 77 00 - CLOSEOUT PROCEDURES: Warranties and maintenance materials.
- E. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's instructions for care and maintenance.
- F. Section 03 35 10 - CONCRETE FLOOR SLAB PREPARATION: for preparation of concrete floor slab substrate.
- G. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected patterns and colors.
- H. Section 09 68 00 - CARPETING: Transition Strips at Carpet.
- I. FLOOR FINISH DRAWINGS.

1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM D2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
  - 2. ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
  - 3. ASTM F1516, Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when recommended).
- B. ADA Accessibility Guidelines for Buildings and Facilities (ADAAG).

1.4 REGULATORY REQUIREMENTS

- A. Volatile Organic Compounds (VOC): Comply with local regulations controlling use of volatile organic compounds for installation products.
- B. Static Coefficient of Friction: ADAAG Appendix Note A4.5 states "A static coefficient of friction of 0.6 is recommended for accessible routes and 0.8 for ramps." Meet the following static coefficient of friction requirements when tested in accordance with ASTM D2047:
  - 1. 0.6 for Accessible Routes.
  - 2. 0.8 for Ramps.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project that are competent in heat-welding techniques required by manufacturer for floor covering installation.
- B. Fire Test Performance: Provide flooring material to meet the following fire test performance criteria.
  - 1. Critical radiant flux: ASTM E648; 0.45 watts per square centimeter or greater.

## SECTION 09 65 00 RESILIENT FLOORING

- C. Moisture Tests: Verify moisture content and alkalinity of concrete slabs in accordance with requirements of Section 01 45 10. Unless otherwise specified by resilient flooring manufacturer, acceptable test results are as follows:
  - 1. Moisture vapor emissions: Not more than 3 lbs/1000 square feet/24 hrs.
  - 2. Alkalinity: pH range between 7 and 9.

### 1.6 SUBMITTALS

- A. Submittal Procedure: See Section 01 33 00.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of flooring, adhesives, underlayment and accessories.
  - 1. Floors under hospital beds: Submit manufacturer's letter or printed literature with specific recommendations for installation of flooring.
- C. Samples: Submit the following samples in duplicate:
  - 1. Sheet flooring: Minimum 6 x 9 inches of each required color.
  - 2. Vinyl Composition Tile flooring (VCT): Minimum 3 x 3 inches of each color.
  - 3. Heat-welded seam samples: For each sheet flooring product and welding bead color and pattern combination required; with seam running lengthwise and in center of 6 x 9 inches sample applied to a rigid backing and prepared by installer for this Project.
  - 4. Rubber base: Manufacturer's standard sample size.
- D. Maintenance Instructions:
  - 1. Submit under provisions of Section 01 78 23.
  - 2. Manufacturer's printed instructions for maintenance.
  - 3. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

### 1.7 DELIVERY, STORAGE & HANDLING

- A. Store floor coverings and installation materials in dry spaces protected from the weather, with ambient temperatures maintained with range recommended by manufacturer, but not less than 50 degrees F or more than 90 deg F. Store rolls upright.

### 1.8 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 85 deg F, in spaces to receive floor tile during the following time periods.
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. After post-installation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install floor coverings after other finishing operations, including painting, have been completed.

### 1.9 MAINTENANCE (Extra Stock)

- A. Save left-over vinyl composite tiles and deliver in original boxes where directed by Contracting Officer.
- B. Provide 10 percent maintenance extra stock of each type and pattern of sheet flooring and deliver where directed by Contracting Officer.

## PART 2 - PRODUCTS

### 2.1 RESILIENT FLOORING

- A. Sheet Vinyl Flooring (SV): As scheduled in Section 09 06 10.
  - 1. Welding rod: As scheduled in Section 09 06 10.
- B. Vinyl Composition Tile (VCT): 1/8 inch thickness, as scheduled in Section 09 06 10.
- C. Rubber Base: Provide continuous base per the following:

## SECTION 09 65 00 RESILIENT FLOORING

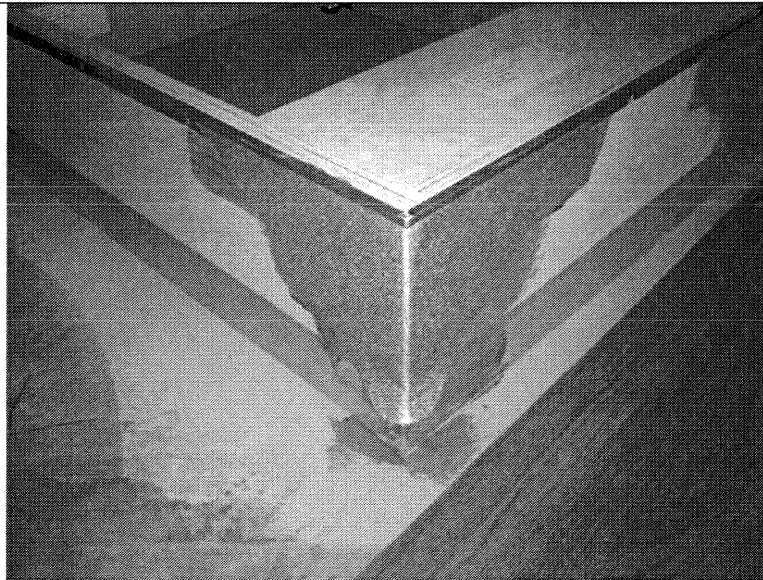
1. Acceptable products: As scheduled in Section 09 06 10.
  - a. Height: 4 inches.
  - b. Thickness: 0.125 inch.
  - c. Style: Standard top-set cove.
- 2.2 TROWELABLE UNDERLAYMENTS & PATCHING COMPOUND
  - A. Raco "Feather Spread," Ardex SD-F "Feather Finish," Dap "WeldCrete 95" or approved equal cementitious underlayment.
- 2.3 PRIMER
  - A. Perma Grain BB-120 for priming substrates under sheet vinyl wood flooring.
- 2.4 SEALANT
  - A. One part polyurethane sealant to seal joints between flooring and door frames and at thresholds. Can be pigmented with water-based coloring.
- 2.5 ADHESIVES
  - A. Low VOC emission and almost no discernible odor type. As manufactured or recommended by the flooring and accessories manufacturers for field installation and flash coving. Henry "Greenline" adhesives are approved except as required by flooring manufacturer's policy on flooring installation at hospital beds.
- 2.6 INTEGRAL COVE BASE ACCESSORIES
  - A. Top trim: Anodized aluminum extrusion.
  - B. Fillet strip for integral cove: Minimum radius of 3/4 inch of wood, wax or plastic as recommended by flooring manufacturer.
- 2.7 VINYL EDGE TRIM
  - A. Roppe No. 42 transition strip.

### PART 3 - EXECUTION

- 3.1 PREPARATION
  - A. Inspect floor surfaces to determine that they are satisfactory and meet requirements of Section 03 35 10.
  - B. Vacuum surface to be covered.
- 3.2 INSTALLATION - GENERAL
  - A. At terminations where two different types of resilient flooring meet, build up substrate with underlayment so that finished surfaces at joints between different flooring materials are uniform and level.
  - B. Trowel underlayment as required to feather edge and make transition appear level.
  - C. Cut termination of flooring in straight line to make a tight hairline joint at juncture of two different materials.
  - D. At doorways, terminate the flooring under door.
- 3.3 INSTALLATION OF SHEET FLOORING
  - A. Unroll sheet floor coverings and allow them to stabilize before cutting and fitting.
  - B. Lay out sheet floor coverings as follows:
    1. Maintain uniformity of floor covering direction.
    2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in floor covering substrates.
    3. Match edges of floor coverings for color shading at seams.
    4. Avoid cross seams.
  - C. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures and built-in furniture, including cabinets and drains.
  - D. Extend floor coverings into toe spaces, door reveals, closets and similar openings.

## SECTION 09 65 00 RESILIENT FLOORING

- E. Maintain reference markers, holes or openings that are in place or marked for future cutting by repeating on floor coverings as marked in substrates. Use chalk or other non-permanent marking device.
- F. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks and other surface imperfections.
- G. Install edge strips at transition to other floors. Trim edge strips to provide square edges for abutting to flooring of different thickness.
- H. Seam Sealing: Sheet flooring shall have heat welded seams.
- I. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and use welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld and finish seams to produce surfaces flush with adjoining floor covering surfaces.
  - 1. Prepare seams in sheet flooring with manufacturer's special routing tool and heat weld with thread in accordance with manufacturer's instructions. Trim off excess thread.
  - 2. Inspect all seams after welding and trimming. Retrim high spots and fuse all incomplete seals with special tool provided by manufacturer.
- J. Provide integral flash cove base where shown on Drawings including cove fillet support strip and top edge cap trim. Construct coved base in accordance with manufacturer's instructions. Do not miter coved outside corners. See method of forming outside corners below.
  - 1. On masonry surfaces or other similar irregular vertical substrates, fill voids between metal top edge strip cove cap and vertical surface with sealant.



Outside Corner Detail

- K. Hand roll flooring at perimeter and seams to assure adhesion. Roll with 100 pound roller in field areas. Refer to specific rolling instructions of flooring manufacturer.
- 3.4 INSTALLATION OF TILE FLOORS
- A. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped or deformed tiles.
    - 1. Lay tiles in pattern as shown on Floor Finish Plans.
  - B. Adhere tiles to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks or other surface imperfections in completed tile installation.



## SECTION 09 65 00 RESILIENT FLOORING

- C. Use full spread of adhesive applied to substrate in compliance with manufacturer's instructions including those for trowel notching, adhesive mixing, and adhesive open and working times.
- D. Provide edge strips at dissimilar flooring and trim edge strips to provide square edges for abutting terrazzo or other thicker flooring.

### 3.5 INSTALLATION OF ACCESSORIES

- A. Apply rubber base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Tightly bond base to substrate throughout length of each piece, with continuous adhesion at horizontal and vertical surfaces.
- B. Provide rubber base where scheduled.
  - 1. Provide rubber base around all casework.

### 3.6 CLEANING & PROTECTION

- A. Protect installed flooring against damage from rolling loads for 48 hours after initial installation.
- B. Provide plywood or hardboard protection when moving heavy loads over floors.
- C. Use dollies to move stationary equipment or furnishings across floor.
- D. Perform following operations upon completion of resilient flooring:
  - 1. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well sealed in adhesive.
  - 2. Damp mop floor being careful to remove black marks and excessive soil.
  - 3. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturer.

END OF SECTION



## SECTION 09 65 19 RESILIENT TILE FLOORING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Resilient tile flooring as indicated in the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 45 10 - VAPOR EMISSION & ALKALINITY TESTING: Testing of concrete slab substrates.
- D. Section 01 77 00 - CLOSEOUT PROCEDURES: Warranties and maintenance materials.
- E. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's instructions for care and maintenance.
- F. Section 03 35 10 - CONCRETE FLOOR SLAB PREPARATION: for preparation of concrete floor slab substrate.
- G. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected patterns and colors.
- H. Section 09 68 00 - CARPETING: Transition Strips at Carpet.
- I. FLOOR FINISH DRAWINGS.

### PART 2 - PRODUCTS

#### 2.1 VINYL PLANK FLOORING

- A. Approved Manufacturers:
  - 1. Toli International, [www.toli.com](http://www.toli.com). Styles and patterns as scheduled in Section 09 06 10.
  - 2. Amtico International, [www.amtico.com](http://www.amtico.com). Styles and patterns as scheduled in Section 09 06 10.

#### 2.2 TROWELABLE UNDERLAYMENTS & PATCHING COMPOUND

- A. Raco "Feather Spread," Ardex SD-F "Feather Finish," Dap "WeldCrete 95" or approved equal cementitious underlayment.

#### 2.3 PRIMER

- A. As recommended by flooring manufacturer.

#### 2.4 SEALANT

- A. One part polyurethane sealant to seal joints between flooring and door frames and at thresholds. Can be pigmented with water-based coloring.

#### 2.5 ADHESIVES

- A. Low VOC emission and almost no discernible odor type. As manufactured or recommended by the flooring and accessories manufacturers for field installation and flash coving. Henry "Greenline" adhesives are approved except as required by flooring manufacturer's policy on flooring installation at hospital beds.

#### 2.6 INTEGRAL COVE BASE ACCESSORIES

- A. Top trim: Anodized aluminum extrusion.
- B. Fillet strip for integral cove: Minimum radius of 3/4 inch of wood, wax or plastic as recommended by flooring manufacturer.

#### 2.7 VINYL EDGE TRIM

- A. Roppe No. 42 transition strip.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

## SECTION 09 65 19 RESILIENT TILE FLOORING

- A. Inspect floor surfaces to determine that they are satisfactory and meet requirements of Section 03 35 10.
- B. Vacuum surface to be covered.

### 3.2 INSTALLATION - GENERAL

- A. At terminations where two different types of resilient flooring meet, build up substrate with underlayment so that finished surfaces at joints between different flooring materials are uniform and level.
- B. Trowel underlayment as required to feather edge and make transition appear level.
- C. Cut termination of flooring in straight line to make a tight hairline joint at juncture of two different materials.
- D. At doorways, terminate the flooring under door.

### 3.3 INSTALLATION OF VINYL PLANKS

- A. Match planks for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut planks neatly around all fixtures. Discard broken, cracked, chipped or deformed planks.
  - 1. Lay planks in pattern as shown on Floor Finish Plans.
- B. Adhere planks to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks or other surface imperfections in completed tile installation.
- C. Use full spread of adhesive applied to substrate in compliance with manufacturer's instructions including those for trowel notching, adhesive mixing, and adhesive open and working times.
- D. Provide edge strips at dissimilar flooring and trim edge strips to provide square edges for abutting terrazzo or other thicker flooring.

### 3.4 INSTALLATION OF ACCESSORIES

- A. Apply rubber base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Tightly bond base to substrate throughout length of each piece, with continuous adhesion at horizontal and vertical surfaces.
- B. Provide rubber base where scheduled.
  - 1. Provide rubber base around all casework.

### 3.5 CLEANING & PROTECTION

- A. Protect installed flooring against damage from rolling loads for 48 hours after initial installation.
- B. Provide plywood or hardboard protection when moving heavy loads over floors.
- C. Use dollies to move stationary equipment or furnishings across floor.
- D. Perform following operations upon completion of resilient flooring:
  - 1. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well sealed in adhesive.
  - 2. Damp mop floor being careful to remove black marks and excessive soil.
  - 3. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturer.

END OF SECTION

## SECTION 09 66 23 RESINOUS MATRIX TERRAZZO FLOORING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install resinous matrix terrazzo flooring as described in the Contract Documents.
- B. Accessories for complete installation of flooring system.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 45 10 - VAPOR EMISSION & ALKALINITY TESTING.
- C. Section 03 35 10 - CONCRETE FLOOR SLAB PREPARATION: for preparation of concrete floor slab substrate.
- D. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.
- E. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: for coordination with sequencing of the Work.

#### 1.3 QUALITY ASSURANCE

- A. Moisture Tests: Verify moisture content and alkalinity of concrete slabs in accordance with requirements of Section 01 45 10. Unless otherwise specified by flooring manufacturer, acceptable test results are as follows:
  - 1. Moisture vapor emissions: Not more than 3 lbs/1000 square feet/24 hrs.
  - 2. Alkalinity: pH range between 7 and 9.

#### 1.4 SEQUENCE & COORDINATION

- A. Work of this Section is affected by need to coordinate installation sequence with Work of other selected trades.
- B. Selected portions of Work of this Section must be installed prior to Work of Section 09 22 16 in spaces scheduled to receive resinous matrix terrazzo flooring.

#### 1.5 MOCK-UP FOR EVALUATION PURPOSES

- A. Prior to beginning Work of Section 09 22 16, construct mock-up to evaluate method of attaching wall framing metal runner track through resinous matrix terrazzo flooring.
- B. Mock-up to be not less than 6 x 6 feet in size, locate where directed in Room 1017, Shelled Storage.
- C. After curing, framing subcontractor shall install piece of floor runner track 6 feet in length over resinous matrix terrazzo flooring and attach using proposed method.
- D. After acceptance of attachment method of runner track, install wall framing 24 inches high with studs spaced at 16 inch centers.
- E. Install gypsum board to one side of mock-up wall framing.
- F. Install 6-inch high resinous matrix terrazzo coved base at side of wall with gypsum board.
- G. Apply seal coat to flooring to provide 3 distinct profiles of slip-resistance for review and selection by Contracting Officer. Selected profile shall become comparison standard for the finished Work.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Approved Product and Manufacturer: Cheminert Terrazzo by Dex-O-Tex, [www.dex-o-tex.com](http://www.dex-o-tex.com).
  - 1. Primer: Vapor Control Primer 100 or 200, depending on vapor emission test results.
  - 2. Crack Isolation Membrane: Cheminert SC Membrane.
  - 3. Divider Strips: Stainless steel by Schluter Systems, [www.schluter.com](http://www.schluter.com).
  - 4. Thin-Set Resinous Terrazzo Matrix: Cheminert Terrazzo, nominal 1/4-inch to 3/8-inch thick thin-set. Color as scheduled in Section 09 06 10.
  - 5. Seal Coat: Posi-Tred O Epoxy Coating.

## SECTION 09 66 23 RESINOUS MATRIX TERRAZZO FLOORING

### 2.2 VAPOR EMISSION REDUCER

#### A. WHEN REQUIRED

1. The need for vapor emission reducer shall be determined by Contractor based on the following:
  - a. Contractor's Project scheduling.
  - b. Contractor's ability to manage installation and protection of underslab vapor retarders and to control placement and drying of concrete floor slabs so concrete is sufficiently dry and water vapor emission rate meets requirements of the Contract Documents.
2. Selection of vapor emission reducer product(s) shall be based on moisture emission rate test results and vapor emission reducer manufacturer's requirements and limitations of their products.
3. Vapor Emission Reducer: Select a vapor emission reducer product acceptable to floor coating and floor covering manufacturers for use under their products specified for this Project.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prepare concrete floor slab substrate in accordance with requirements of Section 03 35 10.
- B. Apply crack isolation membrane over all visible cracks.

### 3.2 PRIMING

- A. Apply primer to prepared substrate in accordance with manufacturer's written instructions.

### 3.3 INSTALLATION

- A. The following Work is to be installed prior to placement of partition floor runner tracks and wall framing in spaces scheduled to receive Work of this Section:
  1. Install primer, crack isolation membrane and terrazzo matrix over prepared concrete substrate at Second and Third Floors.
  2. Flooring material shall flow continuously from one space to another without interruption of wall framing.
- B. Install divider strips under doorways and in corridors to limit areas of Work to what can be installed in one continuous operation. Visible cold joints within the field of room floors will not be acceptable.
- C. Install fluid-applied flooring system in strict accordance with manufacturer's written instructions.
- D. After approval of mock-up and installation of resinous matrix terrazzo flooring without seal coat, install wall framing and gypsum board.
- E. Install adequate temporary protection to keep from damage incomplete installed Work for traffic of other trades.
- F. After installation of wall framing and gypsum board, install cove base and seal coat.
- G. Cove Base: Provide integral cove base where indicated. Provide manufacturer's metal trim at top of base.
- H. Cure and seal finished flooring in accordance with manufacturer's written instructions.

### 3.4 PROTECTION

- A. Allow sufficient cure time, as recommended by flooring manufacturer.
- B. Protect newly installed floor during initial curing by cordoning off access areas to the floor.
- C. Cover newly cured floor with construction paper, plywood or cardboard to minimize abuse from other trades in the area.
- D. Provide maintenance of finished flooring until Date of Substantial Completion.

END OF SECTION

## SECTION 09 67 00 FLUID-APPLIED FLOORING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install fluid-applied flooring as described in the Contract Documents.
- B. Accessories for complete installation of flooring system.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 45 10 - VAPOR EMISSION & ALKALINITY TESTING.
- C. Section 03 35 10 - CONCRETE FLOOR SLAB PREPARATION: for preparation of concrete floor slab substrate.
- D. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.

### PART 2 - PRODUCTS

#### 2.1 FLUID-APPLIED FLOOR SYSTEM 1

- A. Approved Product and Manufacturer: Stoneblend GSI-G by Stonhard, [www.stonhard.com](http://www.stonhard.com).
  - 1. Nominal 3/16-inch thick epoxy mortar flooring system. Color as scheduled in Section 09 06 10.
  - 2. Primer: As recommended by flooring manufacturer.

#### 2.2 FLUID-APPLIED FLOOR SYSTEM 2

- A. Approved Product and Manufacturer: Deco-Flor by Dex-O-Tex, [www.dex-o-tex.com](http://www.dex-o-tex.com).
  - 1. Nominal 1/16-inch to 1/8-inch thick epoxy mortar flooring system. Color as selected by Architect from standard range.
  - 2. Primer: As recommended by flooring manufacturer.
- A. Approved Product and Manufacturer: Deco-Flor by Dex-O-Tex, [www.dex-o-tex.com](http://www.dex-o-tex.com).
  - 1. Primer: Vapor Control Primer 100 or 200, depending on vapor emission test results.
  - 2. Crack Isolation Membrane: Cheminert SC Membrane.
  - 3. Divider Strips: Stainless steel by Schluter Systems, [www.schluter.com](http://www.schluter.com).
  - 4. Thin-Set Resinous Terrazzo Matrix: Cheminert Terrazzo, nominal 1/4-inch to 3/8-inch thick thin-set. Color as scheduled in Section 09 06 10.
  - 5. Seal Coat: Posi-Tred O Epoxy Coating.

#### 2.3 ACCESSORIES

- A. Crack Isolation Membrane: High performance. CT5 and 10-ounce engineering fabric.
- B. Divider Strips: Stainless steel by Schluter Systems, [www.schluter.com](http://www.schluter.com).

#### 2.4 VAPOR EMISSION REDUCER

- A. WHEN REQUIRED
  - 1. The need for vapor emission reducer shall be determined by Contractor based on the following:
    - a. Contractor's Project scheduling.
    - b. Contractor's ability to manage installation and protection of underslab vapor retarders and to control placement and drying of concrete floor slabs so concrete is sufficiently dry and water vapor emission rate meets requirements of the Contract Documents.
  - 2. Selection of vapor emission reducer product(s) shall be based on moisture emission rate test results and vapor emission reducer manufacturer's requirements and limitations of their products.
  - 3. Vapor Emission Reducer: Select a vapor emission reducer product acceptable to floor coating and floor covering manufacturers for use under their products specified for this Project.

## SECTION 09 67 00 FLUID-APPLIED FLOORING

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Prepare concrete floor slab substrate in accordance with requirements of Section 03 35 10.
- B. Proper preparation is critical to ensure proper bond to substrate. Take special care to prepare substrate in accordance with flooring manufacturer's recommendations.
- C. Apply crack isolation membrane over all visible cracks.

#### 3.2 PRIMING

- A. Apply primer to prepared substrate in accordance with manufacturer's written instructions.

#### 3.3 INSTALLATION

- A. Install divider strips under doorways and in corridors to limit areas of Work to what can be installed in one continuous operation. Visible cold joints within the field of room floors will not be acceptable.
- B. Install fluid-applied flooring system in strict accordance with manufacturer's written instructions.
- C. Cove Base: Provide integral cove base where indicated. Provide manufacturer's metal trim at top of base.
- D. Seal and cure finished flooring in accordance with manufacturer's written instructions.

#### 3.4 PROTECTION

- A. Allow sufficient cure time, as recommended by flooring manufacturer.
- B. Protect newly installed floor during initial curing by cordoning off access areas to the floor.
- C. Cover newly cured floor with construction paper, plywood or cardboard to minimize abuse from other trades in the area.
- D. Provide maintenance of finished flooring until date of Substantial Completion.

END OF SECTION



PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Carpet placed with glue down method.
- B. Accessories.
- C. Maintenance extra stock.

1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 45 10 - VAPOR EMISSION & ALKALINITY TESTING: Testing of concrete slab substrates.
- D. Section 01 74 00 - CLEANING: Cleaning during construction and Final Cleaning.
- E. Section 01 77 00 - CLOSEOUT PROCEDURES: Warranties and maintenance materials.
- F. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's instructions for care and maintenance.
- G. Section 03 35 10 - CONCRETE FLOOR SLAB PREPARATION: for preparation of concrete floor slab substrate.
- H. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected patterns and colors.
- I. FLOOR FINISH DRAWINGS.

1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM D2859, Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
  - 2. ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- B. The Carpet and Rug Institute (CRI):
  - 1. CRI 104, Standard For Installation Specification of Commercial Carpet.

1.4 QUALITY ASSURANCE

- A. Reference Standards: Comply with the referenced provisions of CRI 104-02.
- B. Moisture Tests: Verify moisture content and alkalinity of concrete slabs in accordance with requirements of Section 01 45 10. Unless otherwise specified by carpet manufacturer, acceptable test results are as follows:
  - 1. Moisture vapor emissions: Not more than 3 lbs/1000 square feet/24 hrs.
  - 2. Alkalinity: pH range between 5 and 9.

1.5 REGULATORY REQUIREMENTS

- A. Carpeting provided under this section shall meet the following:
  - 1. ASTM E648.
  - 2. Conform to ASTM D2859 for surface flammability ignition test.

1.6 QUALIFICATIONS

- A. Installer shall be certified by carpet manufacturer.
- B. Employ carpet layers with minimum of 3 years experience installing commercial carpets.

1.7 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit 3 copies of manufacturer's data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation. Include the following:
  - 1. All necessary information including maximum substrate moisture emission.
  - 2. Acceptable pH range.
  - 3. Laboratory test data on flame spread, smoke density and floor radiant panel test.

## SECTION 09 68 00 CARPETING

- C. Samples of Carpet: Submit 2 samples 18 x 18 inches in size, for verification purposes, illustrating color, texture, pattern and quality.
  - D. Samples of Vinyl Edge Strips: Manufacturer's sample chain for color selection.
  - E. Shop Drawings: Submit floor plans, showing areas of carpet, pattern, edge strips, seams and other installation details.
    - 1. Do not install carpeting until Shop Drawings have been reviewed by Architect.
  - F. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
  - G. Maintenance Instructions:
    - 1. Submit under provisions of Section 01 78 23.
    - 2. Manufacturer's printed instructions for maintenance.
    - 3. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- 1.8 DELIVERY, STORAGE & HANDLING
- A. General: Comply with CRI 104, Section 5, "Storage and Handling." except as modified herein.
- 1.9 PROJECT CONDITIONS
- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
  - B. Environmental Limitations: Do not install carpet until wet Work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
  - C. Do not install carpet over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.
  - D. Store materials for 3 days prior to installation in area of installation to achieve temperature stability.
    - 1. Relaxing/Conditioning Carpet: Unroll carpet and allow to relax in the installation area not less than 24 hours at a temperature between 65 and 95 degrees F. To facilitate relaxing, pre-cutting carpet is recommended.
- 1.10 WARRANTY
- A. Provide manufacturer's standard ten (10) year warranty against excessive wear, failure of static protection, delamination, edge ravel and zippering.
- 1.11 MAINTENANCE (EXTRA STOCK)
- A. Under the provisions of Paragraph 3.4 A of this Section.

## PART 2 - PRODUCTS

- 2.1 CARPET
- A. Broadloom carpet as scheduled in Section 09 06 10.
- 2.2 PRIMER
- A. As recommended and distributed by carpet manufacturer.
- 2.3 INSTALLATION ADHESIVE
- A. Water resistant, quick release, low emission, low odor, non-staining type as recommended by carpet manufacturer, and which complies with flammability requirement for installed carpet.
    - 1. Henry Greenline GL62 high performance carpet adhesive is approved.
- 2.4 SEAM SEALER
- A. Provide product by carpet manufacturer, for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.

## SECTION 09 68 00 CARPETING

### 2.5 TROWELABLE UNDERLAYMENT & PATCHING COMPOUND

- A. Acceptable products and manufacturers:
  - 1. SD-F Feather Finish by Ardex.
  - 2. Feather Spread by Raco.
  - 3. WeldCrete 95 by Dap.
  - 4. Other approved Substitute.

### 2.6 VINYL EDGE STRIPS

- A. Extruded or molded heavy duty tapered vinyl or rubber carpet edge guard for transition between resilient flooring and carpet.
  - 1. Roppe No. 50 is approved, or equivalent.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with the maximum variation of 1/4 inch in 10 feet and are ready to receive Work.

### 3.2 PREPARATION

- A. Prepare concrete floor slab substrate in accordance with requirements of Section 03 35 10.
- B. Adhesion Testing: Perform tests recommended by manufacturer.
- C. Proceed with installation only after substrates pass testing.
- D. Apply, trowel and float underlayment and patching compound to fill cracks, holes, depressions and rough areas to achieve smooth, flat, hard surface.
- E. Use underlayment to ramp up substrate where carpet abuts thicker flooring.
- F. Prohibit traffic until underlayment and patching compound is cured.
- G. Prime concrete subfloor as recommended by the carpet manufacturer.

### 3.3 INSTALLATION

- A. Vacuum substrate immediately prior to installing carpet.
- B. Install carpet as indicated on reviewed Shop Drawings and in accordance with CRI 104.
- C. Pre-plan installation for uniform direction of pattern and lay of pile, and proper sequencing with other Work.
- D. Verify carpet match before cutting to ensure minimal variation between dye lots.
- E. Double cut carpet, to allow intended seam and pattern match. Make cuts straight, true, and unfrayed.
- F. Join seams by hot adhesive tape method. Form seams straight and parallel, not overlapped or peaked, and free of gaps. Seal seams in accordance with carpet manufacturer's recommendations.
- G. Locate seams at doorways at centerline of door without seam in direction of traffic at doorways.
- H. Locate seams in areas of least traffic. Do not locate seams at high traffic pivot points or at openings in fixed partitions.
- I. Lay carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.
- J. Provide monolithic color, pattern, and texture match within any one area.
- K. Do not change run of pile in any room where carpet is continuous through a wall opening into another room.
- L. Locate change of color pattern between rooms under door centerline.
- M. Cut and fit carpet around interruptions.
- N. Fit carpet tight to intersection with vertical surfaces without gaps.
- O. Edge Treatment: Where carpet abuts resilient flooring, provide vinyl edge strips, except where otherwise shown.

## SECTION 09 68 00 CARPETING

### 3.4 ADJUSTING & CLEANING

- A. Useable pieces of carpet, defined as mill ends less than 9 feet long and pieces larger than 3 square feet in area and wider than 8 inches, left over from installation are property of Owner.
- B. Roll neatly and store where directed by Contracting Officer.
- C. Remove scraps and trimmings from site.
- D. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- E. Clean Work under provisions of Section 01 74 00.
- F. Vacuum completed carpet installation with beater-in-nozzle type commercial vacuum cleaner.
- G. Remove spots and replace carpet where spots cannot be removed to satisfaction of Architect.

### 3.5 PROTECTION

- A. Provide protective methods and materials necessary to ensure that carpeting will be without deterioration or damage at Substantial Completion.
- B. Stains present before Owner's Final Acceptance of Work will be sole responsibility of Contractor.

END OF SECTION

## SECTION 09 72 16 VINYL-COATED FABRIC WALL COVERING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Vinyl wall covering and trim as indicated in the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: for submittal procedures.
- C. Section 01 33 12 – COORDINATED SUBMITTAL REQUIREMENTS: Submittals of this Section are affected by coordinated simultaneous submittal requirements.
- D. Section 09 06 10 – INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM F793, Standard Classification of Wallcovering by Use Characteristics.

#### 1.4 QUALITY ASSURANCE

- A. Work shall be by applicator who has satisfactorily completed at least one project of comparable quality and scope within two years prior to bidding and is approved by Architect.

#### 1.5 REGULATORY REQUIREMENTS

- A. Meet requirements of ASTM E84.
  - 1. Flame Spread Index: Not exceed 25.
  - 2. Smoke Density Index: Not exceed 50.

#### 1.6 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit for each product.
- C. Shop Drawings: Submit drawings showing wall elevations with seaming layout.
- D. Product Samples:
  - 1. Submit manufacturer's full range of 4 by 6 inch samples of wall covering specified for Architect's color selection.
  - 2. Submit 12 inch long sample of trim for each color specified.
- E. Informational Submittals: Submit following packaged separately from other Submittals:
  - 1. Test Reports: Submit test report verifying flame/fuel/smoke rating tested by UL.
  - 2. Manufacturer's written installation instructions.

#### 1.7 FIELD MOCK-UP

- A. Mock-Up Installation: Install three full size panels in each color and pattern in full height and width in area designated by Architect.
- B. Show edge treatment and installed wall covering and joint seaming techniques.
- C. Approved field mock-up may remain part of completed Work.

#### 1.8 DELIVERY, STORAGE & HANDLING

- A. Deliver, store, handle, and protect products under provisions of Section 01 60 00.
- B. Inspect roll materials on site to verify acceptance.
- C. Protect packaged adhesive from temperature cycling and cold temperatures.
- D. Do not store roll goods on end.

#### 1.9 PROJECT / SITE CONDITIONS

- A. Provide continuous ventilation and heating to maintain surface and ambient temperatures above 65 deg F within area of Work once wall covering installation is started.

## SECTION 09 72 16 VINYL-COATED FABRIC WALL COVERING

1. Do not apply adhesive when substrate surface temperature or ambient temperature is below 60 deg F, or when relative humidity is above 40 percent, unless otherwise specifically required by manufacturer's instructions.
2. Indoor Air Quality Procedures: Ventilate in accordance with Section 01355.
- B. Provide illumination of greater than 80 foot candles measured mid-height at substrate surface while painting is in progress.

### 1.10 MAINTENANCE EXTRA STOCK

- A. Extra Materials: Furnish in accordance with Section 01780.
  1. Provide 25 lineal feet of each color and type of wall covering.
  2. Package and label each roll by installation room number; store where directed.
  3. Furnish replacement materials from same production run as installed materials.

## PART 2 - PRODUCTS

### 2.1 APPROVED PATTERNS & MANUFACTURERS

- A. As scheduled under Section 09 06 10.

### 2.2 MATERIALS

- A. Vinyl Wall Covering: ASTM F793 Category V, Type II Commercial Serviceability.
- B. Adhesives: Type recommended by wall covering manufacturer to suit application to substrate; water-based.
  1. Provide adhesive which is mildew resistant and non-staining.
  2. Volatile Organic Compound: Meet Code requirements.
- C. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
- D. Substrate Primer and Sealer: As recommended by wall covering manufacturer.
- E. Termination Trim: Extruded plastic; color to be selected.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Prior to commencing Work of this Section, verify that environmental conditions and substrates meet specified requirements.
- A. Proceed only after deficiencies have been corrected.

### 3.2 PREPARATION

- A. Remove electrical and telephone plates.
  1. Correct minor defects and clean substrates.
  2. Sand glassy surfaces and shellac marks which may bleed.
  3. Vacuum clean surfaces free of loose particles.
  4. Apply one coat [two coats] of primer sealer to substrate surfaces.
- B. Remove wall covering materials from packaging and allow to acclimatize to area of installation 24 hours before application.

### 3.3 VINYL WALL COVERING INSTALLATION

- A. Apply adhesive and wall covering in accordance with Section 01 60 00.
- B. Use wall covering in roll number sequence.
  1. Razor trim edges on flat work table.
  2. Do not razor cut on gypsum board surfaces.
- C. Wall Covering Installation: Apply wall covering smooth, without wrinkles, gaps or overlaps.
  1. Eliminate air pockets and fully bond to substrate surface.
  2. Butt edges tight.
  3. Hang by reversing alternate strips except on matched patterns.
  4. Install seams vertically and plumb, at least 6 inches away from any corner.
  5. Trim selvages to provide color uniformity and pattern match at seams.

## SECTION 09 72 16 VINYL-COATED FABRIC WALL COVERING

6. Install wall covering before installation of bases, hardware, cabinets, or items attached to or spaced slightly from wall surface.
7. Do not install wall covering more than 1/4 inch below top of resilient base.
- D. Termination Trim: Install at exposed terminations of wall covering.
- E. Remove excess wet adhesive from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

### 3.4 CLEANING & PROTECTION

- A. Cleaning: Comply with Section 01 74 00.
- B. Clean as recommended by manufacturer.
- C. Do not use cleaning materials or methods which may damage finish or surrounding construction.
  1. Clean wall covering of excess adhesive, dust, dirt and other contaminants.
  2. Replace wall plates and accessories removed prior to installation.
- D. Protect finished Work in accordance with Section 01 50 00.

END OF SECTION





## SECTION 09 77 00 SPECIAL WALL SURFACING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Architectural wall cladding system including trims, terminations, miscellaneous metal and subframes, clips, fasteners and other devices for secure anchorage of panels to conventional.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 09 21 00 - GYPSUM BOARD ASSEMBLIES.
- C. Section 09 91 00 - PAINTING: for paint finish.

#### 1.3 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Submit complete Shop Drawings indicating quantities, finishes, dimensions and attachment relationships.
- C. Product Data: Submit manufacturer's product data, specifications and installation instructions.
- D. Samples: Submit color and finish samples to determine range of texture and consistency of color and finish expected in finished Work. Standard sample size shall be 3 x 3 inches.

#### 1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver components in clearly marked containers and packages suitable for shipment of specified products to prevent finish damage in transit.
- B. Store components in cool, dry locations that will avoid damage from job-site traffic, moisture, stacking, or other job-site contamination.
  - 1. Do not stack panels directly on floor.
  - 2. Do not subject panels to moisture.
- C. Handle components to avoid racking, twisting, denting or scratching of finished surfaces.

#### 1.6 WARRANTY

- A. Provide manufacturers' standard 1-year warranty against defects in material and workmanship.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Subject to requirements, Graph by Fry Reglet Corp., [www.fryreglet.com](http://www.fryreglet.com).

#### 2.2 MATERIALS

- A. Framing: All framing components to be fabricated from extruded aluminum 6063 T5.
  - 1. Standard clear anodized finish Architectural 200R1 medium etch per AA-M32c10A21.
- B. Infill panels: Base substrate shall be 1/2 inch medium density fiberboard (MDF), 48-pound density, minimum internal bond strength of 110 pounds per square inch.
  - 1. Finish: as scheduled in Section 09 06 10.
- C. Reveal Option: Salient spline.

#### 2.4 FABRICATION

- A. Aluminum framing components to be factory mitered and welded to form 2-way, 2-way and 4-way intersections, inside and outside corners and custom intersections as detailed in approved Shop Drawings.
- B. Wall cladding system shall be capable of providing a fineline joint with an anodized aluminum exposed element bordering each panel horizontally, vertically or in both directions in accordance with Contract Drawings.
  - 1. All other details, including base, head, corners, intersections etc. shall be fabricated in accordance with Contract Drawings.

## SECTION 09 77 00 SPECIAL WALL SURFACING

- B. Infill panels shall be installed in non-progressive manner and must be point accessible. Panels shall be affixed to framework with pullout loading of 10 pounds per inch of attachment.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Examine job-site conditions to verify that walls to receive cladding are dry, flat and rigid. Recommended stud spacing is 16 inch centers.
- B. Climate Control: Material must be stored, installed and maintained only in secured ambient environment (humidity min. 25 percent - max 55 percent, temperature not to exceed 80 deg F).
- C. Verify dimensions of wall panels prior to installation to assure compatibility with job-site conditions.

#### 3.2 INSTALLATION

- A. Install framing components in accordance with manufacturer's product data and approved Shop Drawings.
- B. Wall panels shall be erected plumb, level, square, true to line, securely anchored and in proper alignment and relationship to Work of other trades.

#### 3.3 CLEANING & PROTECTION

- A. Visually inspect all exposed surfaces for scratches or blemishes. Protection of wall panels from damage by other trades after installation shall be responsibility of General Contractor.

END OF SECTION

## SECTION 09 77 14 ACOUSTICAL WOOD PANELS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install acoustical wood panels as described in the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 78 23 - OPERATION & MAINTENANCE DATA: for submittal procedures.
- C. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: for scheduled color selections.
- C. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: for conventional gypsum board suspension system where abuts suspended acoustical ceiling.
- G. Division 26 - ELECTRICAL: for lighting mock-up, attachment of light fixtures.

#### 1.3 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and installation components by a single manufacturer.
- B. Fire Performance Characteristics: Identify wall components with appropriate markings of applicable testing and inspecting organization.
  - 1. Surface Burning Characteristics: As follows, tested per ASTM E84:
    - a. Flame Spread: 75 or less.
    - b. Smoke Developed: 450 or less.
- C. Coordination of Work: Coordinate wall work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Submit shop drawings showing how panels are to be laid out on the walls, details of trim members and width of panels. Width of panels and location of vertical seams are critical.
- C. Product Data: Submit manufacturer's technical data for each type of wall panel required.
- D. Samples: Minimum 3 x 6 inch samples of specified wall panels.
- E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- F. Operation & Maintenance Data:
  - 1. Submit under the provisions of Section 01 78 23, manufacturer's cleaning and maintenance instructions.

#### 1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver wall panels to Project Site in original, unopened packages and store in fully enclosed space, protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Store wood veneer panels where ambient temperature and humidity are continuously maintained near that for Final Occupancy.
- C. Before installing wall panels, permit them to reach room temperature and a stabilized moisture content.
- D. Handle wall panels carefully to avoid chipping edges or damaged units in any way.

#### 1.6 PROJECT CONDITIONS

- A. Space Enclosure: Allow wood veneer wall panel materials to reach room temperature and have stabilized moisture content for not less than 72 hours before installation.
  - 1. Do not store or install wood veneer panels where ambient temperature and humidity are not continuously maintained near that for Final Occupancy.

## SECTION 09 77 14 ACOUSTICAL WOOD PANELS

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Armstrong Woodworks, Natural Variations is Building Standard, [www.armstrong.com](http://www.armstrong.com).
  - 1. No substitutions.

#### 2.2 WALL PANELS

- A. Wall Panels: Type AWP-1.
  - 1. Mineral fiber panels with smooth wood finish, perforated, 5/8-inch thick.
  - 2. K2C2 both vertical edges for interface with aluminum spline for installation.
  - 3. Finish: As scheduled in Section 09 06 10.
  - 4. Size: As indicated on Drawings.
- B. Wall Panels: Type AWP-2.
  - 1. Mineral fiber panels with smooth wood finish, un-perforated, 5/8-inch thick.
  - 2. K2C2 both vertical edges for interface with aluminum spline for installation.
  - 3. Finish: As scheduled in Section 09 06 10.
  - 4. Size: As indicated on Drawings.
- C. Wall Panels: Type AWP-3.
  - 1. Mineral fiber panels with smooth wood finish, custom perforated for diffuser and return air grilles, 5/8-inch thick.
  - 2. K2C2 both vertical edges for interface with aluminum spline for installation.
  - 3. Finish: As scheduled in Section 09 06 10.
  - 4. Size: As indicated on Drawings.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's written recommendations.
  - 1. Approval to proceed by manufacturer's representative which is contrary to manufacturer's written recommendations is not acceptable.
- B. Inspect for defects in Work to receive Work of this Section which is not acceptable.
- C. Report defects to Architect in writing.
- D. Do not install panels until defect are corrected.

#### 3.2 PREPARTION

- A. Measure each wall area and establish layout of acoustical units to balance border widths at opposite edges of each wall.
- B. Coordinate panel layout with mechanical and electrical fixtures.

#### 3.3 INSTALLATION

- A. Install wall panels by attaching panels to wall per manufacturer's written instructions, and in accordance with authorities having jurisdiction.
- B. Attachment of panels to wall will include use of internal splines, provided by panel manufacturer.

#### 3.4 ADJUSTING & CLEANING

- A. Replace damaged and broken panels.

END OF SECTION

## SECTION 09 83 10 ACOUSTIC WALL TREATMENT

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Furnish and install acoustic wall treatments described in the Contract Documents.
- B. Where required: As indicated in Interior Elevations and as scheduled.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 09 06 10 – INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected patterns and colors.
- C. Section 09 91 00 - PAINTING: for painting of AWT-2.
- D. Section 10 11 20 - TACKBOARDS.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

#### 1.4 QUALITY ASSURANCE

- A. Installer: The installation of AWT-1 shall be performed by an authorized installation dealer, licensed by the manufacturer.
- B. Fire Hazard Classification: The acoustical wall treatment systems shall have a fire hazard classification of Class 0-25 when tested in accordance with ASTM E 84.
- C. Noise Reduction: Minimal NRC Range of 0.80.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product specifications and such other data as may be required to show compliance with the contract documents.
- C. Samples of Verification:
  - 1. Submit two (2) samples of specified fabric for verification.
  - 2. Submit two (2) samples of AWT-2.

### PART 2 - PRODUCTS

#### 2.1 AWT-1, ACOUSTIC WALL TREATMENT

- A. System Description: Site-fabricated and installed. Concealed stretch system.
- B. Components:
  - 1. Rigid framework with clamping jaws, square-edges section.
  - 2. Acoustical sub-surface: Manufacturer's standard minimum 1-inch thick fire-retardant sound absorbing padding or panel.
  - 3. Fabric: As scheduled under Section 09 06 10.
  - 4. Fabric Treatment: Protective treatment to provide fire hazard classification and to render fabric washable.

#### 2.2 AWT-2, ACOUSTIC WALL TREATMENT

- A. Material: "Sound Silencer," 1-inch thick porous Arpro polyethylene as distributed by Stop Acoustical Surfaces, [www.acousticalsurfaces.com](http://www.acousticalsurfaces.com).
  - 1. Panel Size: 24 x 48 inches.
  - 2. Color: As scheduled in Section 09 06 10.

### PART 3 - EXECUTION

#### 3.1 EXISTING CONDITIONS

- A. Examine the conditions of the substrate and the conditions under which the work of these sections is to be performed. Notify the Contractor in writing of any unsatisfactory

## SECTION 09 83 10 ACOUSTIC WALL TREATMENT

conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner satisfactory to the installer.

- B. Do not install AWT-1 until painting is completed.

### 3.2 INSTALLATION OF AWT-1

- A. Apply framework in the areas to receive the acoustical wall treatment, as shown on the drawings. Provide symmetrical panels with consideration for fabric width and direction. Secure the framework with suitable mastic and special, heavy duty staples. Provide reveal edge on sides and top.
- B. Install framework plumb and straight, flush in proper alignment with uniform reveals.
- C. Install sub-surface material, continuous and flush, to the shoulder of the track.
- D. The fabric shall be stretched tautly, evenly and smoothly, and be free of defects and flaws.

### 3.3 INSTALLATION OF AWT-2

- A. Glue to drywall surfaces using adhesive and method recommended by vendor. Align panels to fit with hairline joints with panel faces in same vertical plane.

### 3.4 CLEANING & PROTECTION

- A. Clean exposed surface of AWT-1 wall panels. Trim and remove all loose threads.

END OF SECTION

## SECTION 09 84 13 FIXED SOUND-ABSORPTIVE PANELS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide acoustic wall treatment in accordance with the Contract Documents.
- B. Where required: **[As indicated on interior elevations and Section 09 06 00.]**

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 09 91 00 - PAINTING.
- C. Section 10 11 20 - TACKBOARDS: for tackable panels.

#### 1.3 QUALITY ASSURANCE

- A. Installer: Installation of **AWT-1** shall be performed by an authorized installation dealer, licensed by manufacturer.
- B. Fire Hazard Classification: Acoustical wall treatment systems shall have a fire hazard classification of Class 0-25 when tested in accordance with ASTM E84.
- C. Noise Reduction: Minimal NRC Range of 0.80.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product specifications and such other data as may be required to show compliance with Contract Documents.
- C. Samples for Verification:
  - 1. Submit 2 samples of specified fabric for installation.
  - 2. Submit 2 samples of **AWT-2**.

### PART 2 - PRODUCTS

#### 2.1 ACOUSTIC WALL TREATMENT, AWT-1:

- A. System: Site installed and fabricated, concealed stretch system.
- B. Components:
  - 1. Rigid framework with clamping jaws, square edged section.
  - 2. Acoustical sub-surface: Manufacturer's standard minimum 1 inch thick fire retardant sound absorbing padding or panel.
  - 3. Fabric: As scheduled in Section 09 06 10.
  - 4. Fabric treatment: Protective treatment to provide fire hazard classification stipulated and to render fabric washable.

#### 2.2 ACOUSTIC WALL TREATMENT, AWT-2:

- A. Material: "Sound Silencer" 1 inch thick porous Arpro polyethylene, distributed by Stop Acoustical Surfaces [www.acousticalsurfaces.com](http://www.acousticalsurfaces.com).
  - 1. Size: 2 feet x 4 feet.
  - 2. Color: White.

### PART 3 - EXECUTION

#### 3.1 EXISTING CONDITIONS:

- A. Examine conditions of substrate and conditions under which Work of this Section is to be performed. Notify Contractor in writing of any unsatisfactory conditions. Do not proceed with Work until unsatisfactory conditions have been corrected in a manner satisfactory to installer.
- B. Do not install **AWT-1** until painting is complete.

#### 3.2 INSTALLATION, AWT-1:

- A. Apply framework in areas to receive acoustical wall treatment, as shown on Drawings. Provide symmetrical panels with consideration for fabric width and direction. Secure framework with suitable mastic and special, heavy duty staples. Provide reveal edge on sides and top.

## SECTION 09 84 13 FIXED SOUND-ABSORPTIVE PANELS

- B. Install framework plumb and straight, flush in proper alignment with uniform reveals.
  - C. Install sub-surface material, continuous and flush, to shoulder of track.
  - D. Fabric shall be stretched tautly, evenly and smoothly, and be free of defects and flaws.
- 3.3 INSTALLATION, AWT-2:
- A. Glue to drywall surfaces using adhesive and method as recommended by vendor. Align panels to fit with hairline joints with panel faces in same vertical plane.
- 3.4 CLEANING & PROTECTION:
- A. Clean exposed surface of AWT-1 wall panels. Trim and remove all loose threads.

END OF SECTION



## SECTION 09 91 00 PAINTING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide painting in accordance with Contract Documents..
  - 1. Exterior Painting: Touch up where required.
  - 2. Oak veneer wood doors shall be finished under this Section.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Shop Drawings, mill test reports.
- C. Section 03 45 00 - ARCHITECTURAL PRECAST CONCRETE: Pressure washing of architectural precast concrete.
- D. Section 06 40 00 - ARCHITECTURAL WOODWORK: Shop and field-applied finish to architectural woodwork.
- E. Section 06 44 00 - ORNAMENTAL WOODWORK: Shop-applied finish to ornamental woodwork.
- F. Section 08 14 16 - FLUSH WOOD DOORS: FLUSH WOOD DOORS: Factory finish for wood doors.
- G. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected colors.
- H. Section 09 96 00 - HIGH PERFORMANCE COATINGS FOR STEEL: Coatings for steel exposed to weather.

#### 1.3 REFERENCES

- A. Master Painters Institute (MPI):
  - 1. Architectural Painting Specification Manual.
- B. The Society for Protective Coatings (SSPC):
  - 1. SSPC Painting Manual, vol. 2, Systems and Specifications.

#### 1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Except as otherwise specified, provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- B. Coordination of Work: Review other Sections of these Specifications to determine extent of primed materials to be provided. All materials, specified to be provided with primed finish, if exposed to view, shall be finish painted under this Section, regardless if they were shipped with enamel finish.

#### 1.5 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Detailed Painting Schedule: Submit painting schedule for review by the Architect. Prepare this Schedule on the basis of the surfaces, types of paint materials, number of coats required and list the brand name of each product proposed for each use. Submit manufacturer's specifications and application instructions for each product.
- C. Samples: Use representative colors when preparing samples for review. Submit samples for Architect's review of color and gloss only.
  - 1. On 8-1/2" x 11" card stock, provide four (4) samples of each color.
  - 2. Resubmit samples as requested by Architect until acceptable gloss and color are achieved.

#### 1.6 DELIVERY & STORAGE

- A. Deliver materials to Project Site in original containers bearing manufacturer's name and label.
- B. Store materials not in actual use in tightly-covered containers. Protect from freezing where necessary. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions to ensure that workers and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

## SECTION 09 91 00 PAINTING

### 1.7 PROJECT CONDITIONS

- A. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are within the limits of paint manufacture's printed instructions but at least 5 deg F above dew point.
- 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 printed instructions.
- C. Do not paint in snow, rain, fog or mist, or when relative humidity exceeds 85 percent and do not paint damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
  - 1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated, within temperature limits specified by paint manufacturer, during application and drying periods.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE PRODUCTS

- A. Floor Paint: Tnemec.
- B. Lacquer: Parker.
- C. Other Coatings: Parker. No substitutions.
- D. Where the Color Schedule calls for the use of deep tones (interior and/or exterior), it is the responsibility of the painting subcontractor to utilize the appropriate deep base primers by the paint manufacturer for use on the substrate for which they are intended.

### 2.2 MATERIALS

- A. Color Pigments: Pure, non-fading, applicable types to suit exterior substrates and service indicated.
  - 1. Base paint: Pure white, free of pigments.
- B. Caulking: Silicone modified acrylic, or polyurethane, white.

### 2.3 COLORS

- A. Exterior Exposed Precast and Cast-In-Place Concrete: Match MultiCare exterior standard, light shade, ICI custom color reference SPM 235-97.
- B. Steel Exterior Railings: MultiCare standard exterior color, ICI custom color reference SPM 235-97.
- C. Interior Colors: As scheduled in Section 09 06 10.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion or Work. Do not proceed with Work until unsatisfactory conditions have been corrected in a manner acceptable to applicator.
- B. Substrate Test on Concrete and Masonry:
  - 1. Surface moisture test: 17 percent or less, to be checked by a moisture meter, not damp to touch and does not transfer water.
  - 2. Alkalinity test: 6.8 to 8.0.
- C. Starting of painting Work will be construed as applicator's acceptance of surfaces and conditions within any particular area.
- D. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces or conditions otherwise detrimental to formation of a durable paint film.

## SECTION 09 91 00 PAINTING

### 3.2 SURFACE PREPARATION FOR COATINGS

- A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
  - 1. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
  - 2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, re-install removed items.
  - 3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning.
- B. Gypsum Drywall:
  - 1. Repair minor imperfections and holes with finishing or spackling compound and sand smooth after drying.
  - 2. Caulking:
    - a. Caulk all cracks between door frames and drywall surfaces. Tool to uniform square surfaces suitable for paint demarcation.
    - b. Caulk cracks between metal trim of coved sheet vinyl bases and drywall.
    - c. Caulk cracks between acoustical ceiling wall moldings and drywall.
- C. Cementitious Materials: Prepare cementitious surfaces of concrete, concrete block and cement plaster to be painted by removing efflorescence, chalk, dust, dirt, grease, oils and by roughening as required to remove glaze. Delay painting of new concrete and masonry as long as practicable.
  - 1. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
  - 2. Prepare concrete floor surfaces scheduled for painting by shot blasting or by application of commercial etching solution, followed by neutralizer and rinse.
- D. Wood (Transparent Finish): Inspect architectural woodwork for deficiencies, such as surface roughness, open joints, poorly plugged fastener holes and report deficiencies to Contractor.
- E. Galvanized Surfaces:
  - 1. Clean free of oil and surface contaminants with phosphoric acid based solvent and rinse.
  - 2. Prime exterior galvanized metal after pre-treatment with epoxy primer, Devco "Devran 205" or equivalent.
  - 3. Prime interior galvanized surfaces with ICI Dulux Aquacrylic Gripper 3210.
- F. Primed Metal Surfaces: Touch-up prime coat as required prior to painting. Remove any rust down to bare metal and reprime to match existing primer.
- G. Previously Painted Surfaces: Remove all blistered, peeling and scaling paint to a sound substrate. Remove heavy caulk by scrubbing with soap and water. Sand any glossy areas and dust clean. Clean and spot prime any failed areas.
  - 1. Use trisodium phosphate (tsp) and water on protected areas such as eaves and ceilings to remove invisible residues. Rinse clean and let dry. Any existing mildew on the surface shall be completely killed and removed before applying paint.
  - 2. Remove efflorescence from concrete surfaces.

### 3.3 APPLICATION

## SECTION 09 91 00 PAINTING

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
  - 1. Provide finish coats which are compatible with prime paints used. Tint undercoats approximately to the shade of the final coat but with sufficient variation to distinguish them from the preceding coat.
  - 2. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
  - 3. Do not paint over any code-required labels, such as UL and FM, or any equipment identification, performance rating, name or nomenclature plates.
  - 4. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
- B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness of approximately 2 mils per coat.
- D. Mechanical items to be painted include, but are not limited to, the following:
  - 1. Exposed pipes in spaces scheduled to be painted, other than mechanical rooms.
- E. Electrical items to be painted include, but are not limited to, the following:
  - 1. Exposed conduit and boxes on surfaces scheduled to be painted.
- F. Stipple Enamel Finish: Roll and re-distribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks or other surface imperfections. If wall and ceiling surfaces are sprayed, back-roll immediately to achieve texture.
- G. Door Frames: Spray apply paint to steel door and glazing frames. Brush and roll technique may be approved by Architect upon successful demonstration. **Brush marks will not be acceptable.**
- H. Pigmented (Opaque) Finishes: Complete cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
- I. Transparent (Clear) Finish: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes or other surface imperfections.
- J. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint Work not in compliance with requirements of the Contract Documents.

### 3.4 PROTECTION

- A. Protection: Protect Work of other trades, whether to be painted or not, against damage from coating operations. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
  - 1. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their Work, after completion of painting operations
  - 2. At completion of Work of other trades, touch-up and restore all damaged or defaced painted surfaces.

### 3.5 REPAINTING

- A. Provide all painting necessary to present a final finished appearance wherever old Work connects to new, or has been cut, altered, damaged or otherwise marred as a result of

## SECTION 09 91 00 PAINTING

construction under this Contract, including patching where existing anchors, pipes, electrical work, cabinets or other items have been removed or relocated, or where new items have been installed.

- B. Generally, an entire elevation shall be repainted if a portion of the wall is patched.
1. Repainting may be terminated at corners, at full height door jambs and at control joints.
  2. If the results are uneven or spotty in appearance, refinishing shall be extended to entire room, as necessary, subject to Architect's reasonable interpretation of the results.
  3. Such patching or refinishing shall match existing materials and workmanship unless new finish is specified.

### 3.6 EXTERIOR PAINTING SCHEDULE

- A. General: Paint exterior surfaces exposed to view in accordance with this Schedule, except as specifically shown or specified.
1. Concrete, precast concrete:  
1st Coat: Alkali Resistant Primer 1840 Acrylic Cementitious Primer.  
2nd Coat: Millennium 550 100% Acrylic Satin.

### 3.7 INTERIOR PAINTING SCHEDULE

- A. Paint interior surfaces exposed to view in accordance with this Schedule. [PR-03]
1. Drywall (except accent walls):  
1st Coat: Pro Prime 1843 Acrylic Interior PVA Enamel  
2nd Coat: 4350 Klean Air Acrylic Eggshell Enamel  
3rd Coat: 4350 Klean Air Acrylic Eggshell Enamel
  2. Drywall (accent walls):  
1st Coat: Pro Prime 1843 Acrylic Interior PVA Enamel  
2nd Coat: Satin Glow 4850 100% Acrylic Satin Enamel  
3rd Coat: Satin Glow 4850 100% Acrylic Satin Enamel
  3. Drywall, epoxy finish:  
1st Coat: Ameron 335  
2nd Coat: WB Epoxy Semi Gloss
  4. Steel doors, frames:  
1st Coat: 9175 Q.D. Alkyd Primer  
2nd Coat: 4250 park Ave Q.D. Alkyd Semi Gloss Enamel
  5. Drywall (base for wallcoverings):  
1st Coat: Ultra-Hide Alkyd Prime-N-Finish
  6. Wood, natural finish:  
1st Coat: Wash Coat  
2nd Coat: Wiping Stain 3000 Wood Light Semi Transparent Stain  
3rd Coat: 9257601 Water White PreCat 20 Sheen Satin Lacquer  
4th Coat: 9257601 Water White PreCat 20 Sheen Satin Lacquer  
Sand with steel wool between coats.
  7. Floor finish including 4 inch base on wall:  
1st Coat: Tnemec Series 287 Enviro-Pox  
2nd Coat: Tnemec Series 287 Enviro-Pox
  8. Existing walls (painting):  
Remove gloss from wall  
1st Coat: 4550 ProShell Eggshell Enamel

END OF SECTION



## SECTION 09 96 00 HIGH PERFORMANCE COATINGS FOR STEEL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Shop priming and field finishing of Architecturally Exposed Structural Steel.
- C. Field finishing of exposed steel decking.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of Product Data, Samples, and Certificates.
- C. Section 09 06 10 - ARCHITECTURAL COLORS & MATERIALS SCHEDULE.
- D. Section 09 91 00 - PAINTING: for painting not specified herein.

#### 1.3 REFERENCES

- A. National Association of Corrosion Engineers (NACE):
  - 1. Industrial Maintenance Painting
- B. National Paint and Coatings Association (NPCA):
  - 1. Guide to U.S. Government Paint Specifications
- C. Painting and Decorating Contractors of America (PDCA):
  - 1. Architectural Specifications Manual
- D. Steel Structures Painting Council (SSPC):
  - 1. Steel Structures Painting Manual
- E. State of Washington Department of Environmental Quality
  - 1. VOC Limits

#### 1.4 QUALITY ASSURANCE

- A. Perform Work and supply products in compliance with "Premium Grade" specifications of PDCA Architectural Specification Manual.

#### 1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable Code for flame and smoke rating requirements for finishes.

#### 1.6 QUALIFICATIONS

- A. Applicator: Company specializing in performing the Work of this Section with minimum three years documented experience.

#### 1.7 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Provide data on all finishing products.
  - 1. Material List: Submit inclusive list of surfaces and coating systems proposed, including anticipated minimum dry film thickness of each coat.
    - a. Indicate each material and cross-reference specific coating, finish system, and method of application.
    - b. Include composition of pigment and vehicle, with percentages.
  - 2. Manufacturer's Certification that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Samples: Submit two samples, 4 x 6 inch in size illustrating selected colors and textures for each finish system and color selected.
- D. Test Data: Submit adhesion test data of steel deck prior to application of finish materials.

#### 1.8 FIELD SAMPLES

- A. Provide full-coat finish samples on at least 100 sq.ft. of surface for each paint system. Simulate finished lighting conditions for review of in-place Work. Modify as directed until acceptable sheen, color and texture is obtained.
- B. Final acceptance of colors will be from samples applied on the job.

#### 1.9 DELIVERY, STORAGE & HANDLING

## SECTION 09 96 00 HIGH PERFORMANCE COATINGS FOR STEEL

- A. Deliver products to Site in sealed and labeled containers; inspect to verify acceptability.
- B. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Store paint materials at minimum ambient temperature of 45° F and a maximum of 90° F, in ventilated area, and as required by manufacturer's instructions.

### 1.10 PROJECT / SITE CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the coating product manufacturer.

### 1.11 MAINTENANCE (EXTRA STOCK)

- A. Provide 2 gallons of each type and color of coating where directed by Contracting Officer.
- B. Label each container with color, type, in addition to the manufacturer's label.

## PART 2 - PRODUCTS

### 2.1 APPROVED MANUFACTURERS & PRODUCTS

- A. Primer: Perime Primer Series 394 aromatic polyurethane, mio-Zinc filled primer by Tnemec.
- B. Coating: Endura Sheild W.B. Series 1081 waterborne acrylic polyurethane by Tnemec.

### 2.2 MATERIALS

- A. Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

### 2.3 FINISHES

- A. As scheduled in Section 09 06 10.
- B. Dry Film Thickness (DFT): Not less than manufacturer's recommended minimum for each product.
- C. Apply scheduled finish to all exposed surfaces of assembly, member or element.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces scheduled to be finished prior to commencement of Work. Report any condition that may potentially affect proper application.
- B. Test shop-applied primer for compatibility with subsequent cover materials.
- C. Starting of finishing Work will constitute applicator's acceptance of surfaces and conditions.

### 3.2

- A. Surface Preparation:
  - 1. After inspection and before shipping, clean steel Work to be primed.
  - 2. Remove loose rust, mill scale, and spatter, slag or flux deposits.
  - 3. Clean by "Wheel Abrator" or similar process to equivalent of SSPC-SP6/NACE 3 "Commercial Blast Cleaning" with a 1.0 - 2.0 mil surface profile.
- B. Shop Priming:
  - 1. Shop prime surfaces of AESS steel Work, except those members or portions of members to be embedded in concrete or mortar.
  - 2. Prime embedded steel, which is partially exposed, on the exposed portions and the initial 2 inches of embedded areas only.
  - 3. Apply shop primer to "Commercial Blast Cleaned" steel surfaces before any rusting occurs, within 8 hours after cleaning.
  - 4. Immediately after surface preparation, apply specified shop primer in accordance with the manufacturer's printed instructions and at a rate to provide a uniform film.



## SECTION 09 96 00 HIGH PERFORMANCE COATINGS FOR STEEL

5. Use methods which will result in full coverage of joints, corners, edges and all exposed surfaces.
- C. Field Finish:
  1. Remove loose rust, mill scale, and spatter, slag or flux deposits from areas not shop primed.
  2. Clean by "Wheel Abrator" or similar process to equivalent of SSPC-SP6/NACE 3 "Commercial Blast Cleaning" with a 1.0 - 2.0 mil surface profile.
  3. Touch-Up Primer: Apply touch-up primer to exposed areas with the same material as used for shop primer. Feather as recommended by primer manufacturer.
  4. After field touch-up of shop-applied primer, apply specified field-applied finish paint in accordance with the manufacturer's printed instructions and at a rate to provide a uniform film. Apply by brush or spray to provide the minimum specified dry film thickness.
  5. Use methods which will result in full coverage of joints, corners, edges and all exposed surfaces.

### 3.3 MATERIAL PREPARATION

- A. Mix and prepare materials in accordance with manufacturer's directions.
- B. Stir materials before application to produce a mixture of uniform density, and stir as required during application.
- C. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

### 3.4 APPLICATION

- A. Apply and reduce products in strict accordance with manufacturer's printed recommendations and instructions.
- B. Where manufacturer's representative provides field recommendations which conflict with printed recommendations and instructions, allow Architect and Owner to review field recommendations before proceeding.
- C. Insure compatibility between finish coats and primers.
- D. Do not apply finishes to surfaces that are not dry.
- E. Apply each coat to uniform finish.
- F. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- G. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance.

### 3.5 PROTECTION

- A. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting.
- B. At completion of Work of other trades, touch-up and restore all damaged or defaced painted surfaces.

### 3.6 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from Site.
- B. Clean paint from surfaces not intended to be painted. Remove splattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. Replace items that cannot be properly cleaned of paint, or are damaged during cleaning processes.

END OF SECTION



## SECTION 09 96 23 GRAFFITI-RESISTANT COATINGS

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Field finish exposed unfinished masonry, concrete, or stone at the ground floor as indicated on the Drawings and specified herein.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to this Section.
- B. Section 09 91 00 - PAINTING.

#### 1.3 QUALITY ASSURANCE

- A. Applicator Qualifications:
  - 1. Experience in the application of the specified or compatible products.
  - 2. Employs persons trained for the application of the specified products or compatible products.

#### 1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – Submittals.
- B. Product Data: Submit manufacturer's product data sheets for the specified graffiti-resistant coatings and cleaners. Submit description for protection of surrounding areas and non-masonry surfaces, surface preparation, application, and final cleaning.
- D. Environmental Regulations: Submit applicable environmental regulations.
- E. VOC Certification: Submit certification that graffiti-resistant coatings furnished comply with regulations controlling content of volatile organic compounds (VOC).

#### 1.5 ENVIRONMENTAL REGULATIONS

- A. Comply with applicable federal, state, and local environmental regulations.

#### 1.6 MOCK-UPS

- 1. Before full-scale application, review manufacturer's product data sheets to determine the suitability of each product for the specific surfaces.
- 2. Apply each graffiti resistant coating to test panels to determine appropriate strengths, coverage rates, compatibility, effectiveness, surface preparation, application procedures, and desired results.
- 3. Apply graffiti resistant coatings to test panels in accordance with manufacturer's written instructions. Allow 24 hours or until test panels are thoroughly cured before evaluating final appearance and results.
- 4. Apply graffiti paint to test panels and allow at least 48 hours or longer for paint to cure.
- 5. Apply cleaner to test for ease of removal of graffiti.
- 6. Repeat cycles of cleanings as directed by Architect. Do not begin full-scale application until test panels are inspected and approved by Architect and Owner's Representative.

#### 1.7 PRE-APPLICATION MEETING

- A. Convene a pre-application meeting 2 weeks before the start of application of graffiti resistant coatings. Require attendance of parties directly affecting work of this section, including the Contractor, Architect, applicator, and product manufacturer's representative. Review environmental regulations, test panel procedures, protections of surrounding areas and nonmasonry surfaces, surface preparation, application, field quality control, final cleaning, and coordination with other work.

#### 1.8 DELIVERY, STORAGE & HANDLING

- A. Deliver materials to the job site in original, tightly sealed, unopened containers, with labels clearly identifying product name and manufacturer. Verify that the product matches that of the original sample applied on the test panel.
- B. Store containers upright in a cool, dry place. Keep away from sparks and open flame. Store and handle materials in accordance with manufacturer's written instructions.

## SECTION 09 96 23 GRAFFITI-RESISTANT COATINGS

- C. Must use product within 48 hours of opening container.

### 1.9 PROJECT CONDITIONS

- A. Surface Preparation: Contractor or applicator shall be responsible for providing a clean, dry substrate free from oil, dirt, grease, efflorescence or any other coating which may inhibit penetration and adhesion of graffiti resistant coating. This requirement applies to new construction, renovation or remedial projects. Substrate must be completely dry prior to applying product.
- B. Environmental Requirements:
  - 1. Temperature: Product may be applied at any temperature providing that there is no frozen moisture present in the substrate. When applied at temperatures below 40 degrees Fahrenheit the product may cure at a slower rate. Optimal temperatures should be above 40° F (5° C) or below 95° F (35° C).
  - 2. Do not apply material if the substrate is wet or contains frozen moisture. Allow substrate to dry for a minimum of 48 hours after rain or power washing.
  - 3. Do not apply material during inclement weather or if precipitation is expected within 12 hours.
  - 4. Do not use spray methods of application under windy conditions.
- C. Protection:
  - 1. Special precautions should be taken to avoid fumes from entering the building being treated. Ventilation systems and fresh air intakes should be turned off and covered.
  - 2. Protect shrubs, metal, glass, vehicles, and other building hardware from overspray.

## PART 2 - PRODUCTS

### 2.1 GRAFFITI RESISTANT COATING

- A. Breathable, non-sacrificial, clear, penetrating sealer and water repellent.
- B. Approved Product and Manufacturer
  - 1. Fabrishield Paint Repellent by Fabrikem, [www.fabrikem.com](http://www.fabrikem.com).

### 2.2 GRAFFITI REMOVER

- A. Approved Product and Manufacturer
  - 1. Fabrikem PR Cleaner by Fabrikem, , [www.fabrikem.com](http://www.fabrikem.com).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify the following:
  - 1. The required joint sealants have been installed.
  - 2. New masonry and mortar has cured a minimum of 28 days.
  - 3. Surface to be treated is clean, dry, and contains no frozen moisture.
  - 4. Environmental conditions are appropriate for application.

### 3.2 PROTECTION

- A. Protect surrounding areas, glass, landscaping, building occupants, pedestrians, vehicles, and non-masonry surfaces during the work from contact with graffiti resistant coatings.
- B. Special precautions should be taken to prohibit fumes from entering the building being treated. Ventilation systems and fresh air intakes should be turned off and covered.

### 3.3 SURFACE PREPARATION

- A. Clean all dirt, oil, grease, mold, mildew, efflorescence, or any other coating or material from surfaces that interfere with penetration, performance, adhesion, or aesthetics of graffiti resistant coatings. Rinse thoroughly, using pressure water spray to remove cleaner residues. Allow surfaces to dry completely before application of graffiti resistant coatings.
- B. Repair, patch, and fill all cracks, voids, defects, and damaged areas in surface as approved by the Architect. Allow repair materials to cure completely before application of graffiti resistant coatings.

## SECTION 09 96 23 GRAFFITI-RESISTANT COATINGS

- C. Seal all open joints.
- D. Allow new masonry and concrete construction and repointed surfaces to cure for a minimum of 28 days before application of graffiti resistant coatings.

### 3.4 APPLICATION

- A. Apply graffiti resistant coatings to substrates in accordance with manufacturer's written instructions, environmental regulations, and application procedures determined from the test panel results approved by the Architect. Graffiti protection requires a two-coat application. In most cases, the first coat will be Super Strength. The second coat will be either Super or Extra, depending on the porosity of the substrate.
- B. Apply to clean, dry, cured, and properly prepared surfaces approved by Architect.
- C. Apply material as shipped by the manufacturer. Do not dilute.
- D. Do not apply to below-grade surfaces.
- E. Do not apply to painted surfaces.
- F. Do not apply to compensate for structural or material defects in substrates.
- G. Do not apply to substrates such as asphalt or polystyrene which may be affected by the solvent carrier.

### 3.5 FIELD QUALITY CONTROL

- A. Inspection: Inspect the graffiti resistant coating work with the contractor, Architect, applicator, and Professional Products of Kansas representative, and compare with test panel results approved by the Architect. Determine if the substrates are suitably protected by the graffiti resistant coatings.
- B. Manufacturer's Field Services: Provide the services of a manufacturer's authorized field representative to verify specified products are used; protection, surface preparation, and application of graffiti resistant coatings are in accordance with the manufacturer's written instructions; and the test panel is approved by the Architect.

### 3.6 FINAL CLEANING

- A. Upon completion of all work covered in a specification, the Contractor shall remove all equipment, material and debris, leaving the area in an undamaged and acceptable condition. Dispose of graffiti resistant coating containers according to state and local environmental regulations.
- B. Repair, restore, or replace to the satisfaction of the Architect, all materials, landscaping, and non-masonry surfaces damaged by exposure to graffiti resistant coatings.

END OF SECTION



## SECTION 10 11 20 TACKBOARDS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Custom fabricated panels of varying sizes consisting of fabric stretched over tackable backing.

#### 1.2 RELATED SECTIONS

- A. Section 01 33 00 SUBMITTAL PROCEDURES: Submittal procedures.
- B. Section 09 06 10 – INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Fabric selections.
- C. Drawings: For locations and panel sizes.

#### 1.3 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Samples: Submit fabric samples for color verification.

### PART 2 - PRODUCTS

#### 2.1 BACKING MATERIAL

- A. Homasote 440, 1/2 inch thick.

#### 2.2 FABRIC

- A. Fabrics: As scheduled in Section 09 06 10.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Field measure areas to be covered.

#### 3.2 FABRICATION

- A. Cut backing material accurately to required size with sharp blade.
- B. Paint faces of backing white.
- C. Wrap fabric around backing material, allowing for the build-up of fabric for final panel size.
  - 1. If pattern is directional, always run pattern either vertically or horizontally as directed.
  - 2. Stretch fabric horizontally and vertically and staple to the backside of panel.
  - 3. Do not glue fabric to backing on panel faces.
- D. Fabricate panel lengths to match workstation modules.

#### 3.3 INSTALLATION

- C. Secure tackboard panels under wall cabinets and other recessed areas by spot gluing using construction adhesive.
  - 1. Use finishing nails as required to temporarily hold panels in place until adhesive sets.
  - 2. Remove nails or drive nails under fabric so that no nails will show.

END OF SECTION





## SECTION 10 14 00 SIGNAGE

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Interior signage is by separate Contract.
- B. Coordination for future installation of interior signage.

#### 1.2 RELATED SECTIONS

- A. Section 01 10 00 - SUMMARY OF WORK: Work by separate contract.
- B. Section 01 31 13 - PROJECT COORDINATION: Coordinate space requirements.
- C. DRAWINGS: For area allocations on walls to receive interior signage.

#### 1.3 COORDINATION

- A. Coordinate the Work with areas on walls allocated to receive interior signage.
- B. Do not allow installation of mechanical or electrical Work in wall areas allocated on Drawings to receive interior signage.

#### 1.4 TEMPORARY SIGNAGE

- A. Install and maintain temporary signage to deter trades from installing Work in wall areas allocated on Drawings to receive interior signage.
  - 1. Remove temporary signage prior to commencement of finish Work.

END OF SECTION



## SECTION 10 21 23 CUBICLE CURTAINS & TRACK

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Ceiling-Mounted Cubical Track.
- B. Cubical Curtains.
- B. Ceiling-Mounted Shower Track.
- B. Shower Curtains.

#### 1.2 RELATED SECTIONS

- A. Section 01 25 13 - PRODUCT SUBSTITUTION PROCEDURES.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Samples.
- C. Section 01 77 00 - CLOSEOUT PROCEDURES: Prerequisites to Substantial Completion, extra stock.
- D. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Curtain fabric selections.
- E. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Concealed backing.
- F. Section 09 53 23 - METAL ACOUSTICAL CEILING SUSPENSION SYSTEM: Mounting substrate.

#### 1.3 REFERENCES

- A. National Fire Protection Association (NFPA):
  - 1. NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Film.

#### 1.4 SUBMITTALS

- A. Submittal Procedure: See Section 01 33 00.
- B. Samples: Provide 12" x 12" samples of curtain fabric.

#### 1.5 MAINTENANCE (EXTRA STOCK)

- A. Provide extra curtains at the rate of 20 percent of the curtains indicated for each size and pattern but not less than one of each size and pattern.

### PART 2 - PRODUCTS

#### 2.1 TRACK

- A. Acceptable Manufacturers: General Cubicle Company is the basis of this Section. Subject to compliance with requirements, other manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:
  - 1. Imperial Fastener Company.
  - 2. Approved Substitution.
- B. Track: Surface-mounted 1-3/8" x 3/4" extruded aluminum 6062W, with white baked enamel finish.
- C. Carriers: 1062N.
  - 1. Quantity: Provide one carrier per 4 inches of track, plus one additional carrier at track ends.
- D. Track Fabrication: Provide tracks in longest practical lengths. Custom bend to radii shown using method that will provide smooth uniform curves.

#### 2.2 TRACK ACCESSORIES

- A. End Stops: Provide 162W stops at ends.
- B. Chains: Provide chains on shower curtains to provide 18 inches sprinkler clearance below ceiling.
- C. Shower Curtain Hooks: Provide shower curtain hooks at end of chains.
- D. Concealed Backing: Provide 7/8 inch drywall furring channels per Section 09 22 16 above acoustical tees for mounting track, where track is not mounted to acoustical tees.
- E. Fasteners:
  - 1. Self-drilling 8 x 2 screws as recommended by manufacturer for drilling into furring channels.

## SECTION 10 21 23 CUBICLE CURTAINS & TRACK

2. Oval-head machine screws and nuts for attachment to "Bolt Slot" metal acoustical ceiling suspension system tees.

### 2.3 PRIVACY CURTAINS

- A. Fabrics: As scheduled in Section 09 06 10. Fabric shall be non-combustible or rendered flame retardant per NFPA 701.
- B. Curtain Mesh: Flameproof nylon open mesh, complying as unobstructed construction for sprinkler coverage.
  1. Approved manufacturer and product: Fantagraph, Sapor Mesh 9119, 00 White.
- C. Curtain Fabrication:
  1. Fabricate curtains of single piece, sized 25 percent wider than track length.
  2. Terminate top of curtain 84 inches above floor, tab top shall extend to ceiling-mounted track.
  3. Terminate bottom of curtain at 12 inches above floor.
  4. Tab Top: Fabricate 1-1/2 inches wide triple-folded tab top from curtain fabric sewn with double needle lock stitch reinforcement. Fold over top. Lockstitch bottom edge and install with rust-proof chrome-plated grommets at 6 in centers for attachment of carriers at top.
  5. Curtain Heading: Triple thickness 2 inches wide. Lockstitch seams in two rows.
  6. Bottom and Side Hems: Double fold bottom and side hems 2 inches wide. Lockstitch seams in two rows.
  7. Vertical Seams: Serged and double-needle lockstitch seams, match pattern where applicable.

### 2.4 SHOWER CURTAINS

- A. Curtain Fabric: 200 Denier nylon, white.
- B. Fabricate curtains with stainless steel grommets.
- C. Length: Curtains to hang 12 inches clear of floor.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install concealed backing above metal acoustical ceiling suspension grid.
  1. Drill oversized holes in acoustical ceiling panels and install 1-1/2 inch long tube spacers.
  2. Securely fasten track to concealed backing with fasteners as recommended by manufacturer.
  3. Fasteners shall not interfere with carrier movement inside tracks.
  4. Where possible, bolt track to acoustical ceiling tees.
- B. Install end stops on open ends only. Fit track ends snug to walls.
- C. All carriers shall ride free of any obstructions. Remove any burrs or projecting screws.

END OF SECTION

## SECTION 10 22 26 FOLDING PANEL PARTITIONS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide folding panel partitions in accordance with Contract Documents.
- B. Support substructure below structural floor slab above.
- C. Where Required:
  - 1. Room 1037 Conference.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 25 13 - SUBSTITUTION PROCEDURES: Product Substitutions.
- C. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data Submittals.
- D. Section 01 36 00 - DELEGATED DESIGN REQUIREMENTS: Bidder-designed support substructure below floor slab above.
- E. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's product data.
- F. Section 05 50 00 - METAL FABRICATIONS: Embed items.
- G. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Color selections.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E90, Standard Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions and Elements.
  - 2. ASTM E336, Standard Test Method for Measurement of Airborne Sound Insulation in Buildings.
  - 3. ASTM E413, Classification for Rating Sound Insulation.
  - 4. ASTM E557, Standard Practice for Architectural Application and Installation of Operable Partitions.

#### 1.4 SYSTEM DESCRIPTION

- A. Overall weight of partition, track, and other items provided by manufacturer shall not exceed 9.5 lb/sq ft of area.
- B. Header or track system shall be fully adjustable to allow future adjustments of 1/2 inch maximum upward and 1/2 inch maximum downward from original installed position.
- C. Partitions shall not require floor mounted track or guide system, except at stacking pocket.
- D. Track shall be smooth and joints align so partition trolleys do not catch or bind.
- E. Sound Transmission Class (STC) Rating: 50 minimum when tested in accordance with ASTM E90 and calculated in accordance with ASTM E413.
- F. Noise Isolation Class (NIC) Rating: 38 minimum when field-measured on installed partition in accordance with ASTM E336 and calculated in accordance with ASTM E413 when installed on header configuration shown on Contract Documents.
- G. Folding partitions shall be repairable at installation site.
- H. Supporting head track shall be hidden.
- I. Panel Skins: fabric wrapped MDF.
- J. Hinge Type: SOSS.
- H. Opening Size: As indicated on Drawings.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified in writing by the folding panel partition manufacturer, as qualified to install the manufacturer's partition systems for Work similar in material, design, and extent to that indicated for this Project.
- B. Preparation of opening shall conform to the criteria set forth per ASTM E557.

#### 1.6 DEFINITIONS

- A. Major Maintenance: is defined as defects in manufacturing or installation that will not allow partition to function as intended.

## SECTION 10 22 26 FOLDING PANEL PARTITIONS

### 1.7 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit catalog cuts or other manufacturer's data sheets describing construction, materials, hardware, finish, dimensions, details, rough-in dimensions, methods of anchorage and any other pertinent information.
- C. Samples: Furnish samples of accessories, if requested by Architect, when submitting products other than the specified Standards.
- D. Setting Drawings: Show imbedded items and cutouts required in other Work, including support beam punching template.
- E. Operation & Maintenance Data: Submit under the provisions of Section 01 78 23.
  - 1. Manufacturer's printed instructions for operation and maintenance.
  - 2. Include maintenance procedures and recommended maintenance materials.

### 1.8 PROJECT / SITE CONDITIONS

- A. Field Measurements:
  - 1. Field measurements of rough openings to be provided to Manufacturer by Manufacturer's field representative.
- B. Coordinate installation of folding panel partitions with Work of other trades.
  - 1. Do not begin Work until support construction is complete.
  - 2. Partitions to be installed after completion of finish floor installation.

### 1.9 WARRANTY

- A. Ten year warranty on folding partition installation and on folding partition and other related items provided by Manufacturer. Warranty to begin at date of Substantial Completion.
- B. Include coverage for smooth operation of panels and for Noise Isolation and Sound Transmission performance, including sound seals panel-to-panel and at panel-to-floor conditions, based on specified requirements.

### 1.10 MAINTENANCE

- A. Provide instruction manuals covering maintenance and repair of folding panel partitions at Substantial Completion Meeting.
- B. During Warranty Period, provide major maintenance at no additional cost to Owner. Provide requested maintenance within ten days of notification.
- C. Extra Materials: Provide appropriate repair parts and tools unique to minor partition maintenance and adjustment at completion of installation.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturers: Subject to compliance with requirements, provide products from the following:
  - 1. Series 932 by Modernfold. [www.modernfold.com](http://www.modernfold.com).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine flooring, structural support, and opening, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of folding panel partitions.
  - 1. Verify that floors and ceilings adjacent to partitions are within allowable tolerances.
  - 2. Verify that support components are accurately placed prior to beginning Work.
  - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Comply with the requirements of ASTM E557, folding panel partition manufacturer's written installation instructions, Drawings and approved Shop Drawings.
- B. Install folding panel partitions and accessories after other finishing operations, including painting have been completed.

## SECTION 10 22 26 FOLDING PANEL PARTITIONS

- C. Match partition panels by installing panels from marked packages in numbered sequence indicated on approved Shop Drawings.
- D. Broken, cracked, chipped, deformed or unmatched panels are not acceptable.

### 3.3 FIELD QUALITY CONTROL

- A. After installation, conduct visual inspection for effectiveness of acoustical seals.
  - 1. Perform visual inspection with room lights turned on one side of partition and space on opposite side darkened. There shall be no light leakage from lighted space to darkened side.
- B. Acoustical Field Testing: ASTM E413 and ASTM E336.
  - 1. If Contracting Officer questions effectiveness of NIC or STC requirements of installed partition, additional services of independent consultant or testing laboratory may be retained to perform field examinations or tests.
  - 2. If installation is found significantly deficient by independent consultant or testing laboratory, correct Work to meet specified requirements and pay cost of initial and re-inspection or testing.

### 3.4 ADJUSTING & CLEANING

- A. Adjust partitions to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Leave system level and plumb.
- B. Clean finish surfaces and accessories in accordance with manufacturer's directions and Section 01 74 00.
- C. Provide final protection and maintain conditions in a manner acceptable to the manufacturer and installer that insure folding panel partitions are without damage or deterioration at date of Substantial Completion.
- D.

### 3.5 DEMONSTRATION

- A. Demonstrate proper operation and maintenance procedures under the provisions of Section 01 79 00.

END OF SECTION





## SECTION 10 26 00 WALL PROTECTION

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Vinyl corner guards.
- B. Vinyl crash rails.
- C. Stainless steel crash rails.
- D. Wainscot wall panels.
- E. Related accessories.

#### 1.2 RELATED SECTIONS

- A. Section 01 77 00 - CLOSEOUT PROCEDURES: Prerequisites to Substantial Completion, extra stock.
- B. Section 06 40 00 - ARCHITECTURAL WOODWORK: Wood chair rail at wainscot.
- C. Section 07 71 00 - DOOR HARDWARE: Door plates.
- D. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Curtain fabric selections.
- E. Section 09 22 10 - GYPSUM BOARD ASSEMBLIES: High-impact gypsum board to receive wainscot wall protection.
- F. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Concealed heavy gauge stud backing.
- G. Division 11 - EQUIPMENT.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

#### 1.4 QUALITY ASSURANCE

- A. Flame Spread: All plastic material furnished herein that will be exposed in the finished Work shall have a flame spread rating of 25 or less when tested in accordance with ASTM E 84, with a smoke developed density of less than 450.

#### 1.5 PROJECT CONDITIONS

- A. At time of installation, ambient temperature and humidity shall be continuously maintained near that for Final Occupancy.

### PART 2 - PRODUCTS

#### 2.1 CORNER GUARDS

- A. Acceptable Manufacturers:
  - 1. InPro Corporation (IPC), [www.inprocorp.com](http://www.inprocorp.com).
  - 2. C/S Group Acrovyn, [www.c-sgroup.com](http://www.c-sgroup.com).
  - 3. No substitutions.
- B. Quality Standard: As scheduled under Paragraph 2.1C of this Section, surface-mount with 1/4-inch radius. Furnish continuous 0.063-inch aluminum retainers. Colors as scheduled in Section 09 06 10.
- C. Schedule of Corner Guards:

SCHEDULE OF CORNER GUARDS				
Mark	Manufacturer	Model	Size (inches)	Remarks
CG-A	C/S Acrovyn	SM-20	3 x 3	Vinyl.
CG-B	C/S Acrovyn	SSM-25	2 x 2	Vinyl.
CG-C	C/S Acrovyn	SM-20M	3 x 3	Vinyl.
CG-D	C/S Acrovyn	CO-8	3-1/2 x 3-1/2	Stainless Steel
CG-E	C/S Acrovyn	SCO-8	3-1/2 x 3-1/2	Stainless Steel
CG-F	Gordon	941-278-58		Projection edge trim.
CG-G	C/S Acrovyn	CO Series		Stainless Steel

## SECTION 10 26 00 WALL PROTECTION

### 2.2 VINYL CRASH RAILS

- A. Acceptable Manufacturer and Product:
  - 1. Model SCR-80E by C/S Group, [www.c-sgroup.com](http://www.c-sgroup.com).
  - 2. No Substitutions.
- B. Colors as scheduled in Section 09 06 10.

### 2.3 STAINLESS STEEL CRASH RAILS

- A. Acceptable Manufacturer and Product:
  - 1. Model SCR-16-SSP, 5 1/2-inch height by C/S Group, [www.c-sgroup.com](http://www.c-sgroup.com).
  - 2. No Substitutions.
- B. Colors as scheduled in Section 09 06 10.

### 2.4 WALL PANELS

- A. Acceptable Manufacturers: Subject to requirements provide products by one of the following:
  - 1. Acrovyn by C/S Group, [www.c-sgroup.com](http://www.c-sgroup.com).
  - 2. InPro Corporation (IPC), [www.inprocorp.com](http://www.inprocorp.com).
  - 3. No Substitutions.
- B. Wall panels to be manufactured of 0.40-inch thick vinyl/acrylic bonded to face side of 3/8-inch (9.53 mm) thick particle board core. Backside of panels to be laminated with moisture-resistant sheet.
  - 1. Provide 43 x 114 inches panel sizes with beveled edges. Provide matching color trim.
- C. Basis of Design: High Impact Wall Panels by C/S Acrovyn.
  - 1. Top of Wainscot: Standard wainscot molding.
  - 2. Inside corner molding.
  - 3. Outside corner molding.
  - 4. Vertical Joints: No molding.
  - 5. Bottom Edge: Recessed cove molding.

SCHEDULE OF WALL PROTECTION PANEL PRODUCTS			
Mark	Manufacturer	Thickness (inches)	Remarks
WP-1	C/S Acrovyn	0.040	Colors and patterns as scheduled in Section 09 06 10.
WP-2	C/S Acrovyn	0.060	Colors and patterns as scheduled in Section 09 06 10.
WP-3	C/S Acrovyn	0.040 vinyl bonded to 3/8 backing.	Square edge. Colors and patterns as scheduled in Section 09 06 10.
WP-4	Panolam		Wood FRL wainscot with trim. Specified in Section 06 83 00. Colors and patterns as scheduled in Section 09 06 10.
WP-5	Panolam		Wood FRL, full-height. Specified in Section 06 83 00. Colors and patterns as scheduled in Section 09 06 10.
WP-6	Panolam		Graphic FRL, full-height. Specified in Section 06 83 00. Colors and patterns as scheduled in Section 09 06 10.
WP-7			At end wall of Nurse Stations
WPP	C/S Acrovyn		Wall panel

### 2.5 ACCESSORIES

## SECTION 10 26 00 WALL PROTECTION

- A. Adhesive: Provide water-based acrylic adhesive as furnished and recommended by manufacturer.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and conditions under which Work is to be performed and identify conditions detrimental to proper or timely completion.
- B. Do not proceed until unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Prior to installation, clean substrate to remove dirt, debris and loose particles.
- B. Perform additional preparation procedures as required by manufacturer's written instructions.
- C. Take all necessary steps to prevent damage to material during installation as required in manufacturer's written installation instructions.

#### 3.3 INSTALLATION

- A. General: Install Work of this Section in strict accordance with manufacturer's recommendations, using only mounting hardware approved by manufacturer, and locating all components firmly into position, level and plumb.
- B. Corner Guards:
  - 1. Install corner guards from top of rubber base to match top of door frames. See interior elevations. Cap tops with matching color trim.
  - 2. Install extruded aluminum retainers by screwing to wall studs in accordance with manufacturer's standard details.
  - 3. Adjust installed end caps as necessary to ensure tight seams.

#### 3.4 CLEANING

- A. General: Immediately upon completion of installation, clean vinyl covers and accessories in accordance with manufacturer's recommended cleaning method.
- B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of Work.

#### 3.5 PROTECTION

- A. Protect installed materials to prevent damage by other trades.
- B. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION



## SECTION 10 28 00 TOILET ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide toilet accessories in accordance with Contract Documents.
- B. Schedule of toilet accessories.

#### 1.2 RELATED SECTIONS

- A. Section 01 25 13 - SUBSTITUTION PROCEDURES: Product Substitutions.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data Submittals.
- C. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's product data.
- D. Section 08 80 00 - GLAZING: unframed mirrors.
- E. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Color selections.
- F. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Concealed backing.
- G. Section 10 21 23 - CUBICAL CURTAINS & TRACK: Shower curtains and ceiling-mounted track.
- H. Division 26 - ELECTRICAL: Electrical connection of hand dryers.

#### 1.3 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. ASTM B456, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
  - 2. ASTM C1036, Standard Specification for Flat Glass.

#### 1.4 QUALITY ASSURANCE

- A. Warranties: Furnish manufacturer's standard five (5) year warranty on hand dryers.

#### 1.5 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Product Literature: Submit catalog cuts or other manufacturer's data sheets describing construction, materials, hardware, finish, dimensions, details, rough-in dimensions, methods of anchorage and any other pertinent information.
- C. Samples: Furnish samples of accessories, if requested by Architect, when submitting products other than the specified Standards.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products from one of the following manufacturers, unless otherwise noted. Prior approval shall be required for all unspecified manufacturers.
  - 1. Bobrick Washroom Equipment, Inc.
  - 2. McKinney/Parker.
  - 3. Watrous.
- B. Manufacturer's name, trade mark or similar identification shall not appear on any work where it is visible from any angle.
- C. Locks on toilet accessories shall be keyed alike and keyed with existing accessories, as applicable.

#### 2.2 MATERIALS AND FINISH

- A. Stainless Steel: AISI Type 302 / 304, with No. 4 finish, 22 gauge minimum.
  - 1. Furnish grab bars with satin finish.
- B. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B456, Type SC 2. Where dull chrome option is available, furnish specified units in dull chrome.
- C. Mirror Glass: Nominal 6.0 mm (0.23 inches) thick, conforming to ASTM C1036, Type I, Class 1, Quality q2, and with silvering, electro-plated copper coating and protective organic coating.

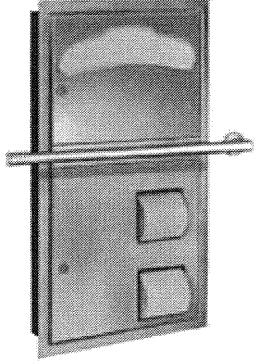
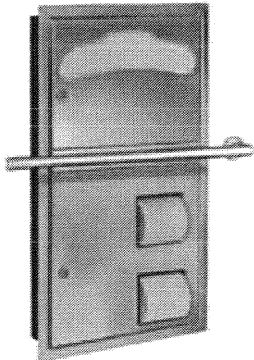
## SECTION 10 28 00 TOILET ACCESSORIES

### 2.3 FASTENINGS AND ANCHOR PLATES

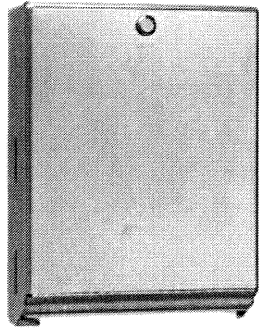
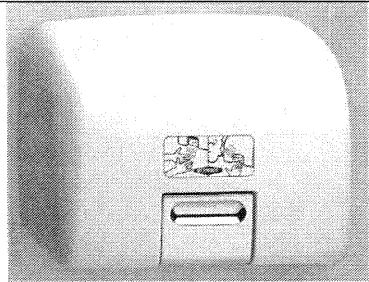


- A. Provide all fastenings as required to securely attach accessories to surfaces. Fabricate of same base metal as accessories. Plates and fastenings shall be strong enough to withstand the expected loads.
- B. Grab bars shall be furnished with concealed anchor plates.

### 2.4 SCHEDULE OF ACCESSORIES

- A. The following accessories correspond to the accessory types shown on the Drawings. The "B" numbers are Bobrick accessories, and establish the design and quality of the units.

<b>1. COMBINATION DISPENSER</b>		
Where Required: Locate in public and staff toilets unless otherwise noted.	Bobrick  Model: B-5922-69  Mounting: Recessed in gypsum board partitions.	
<b>2. COMBINATION DISPENSER</b>		
Where Required: Locate in all public and staff toilets.	Bobrick  Model: B-5922  Mounting: Recessed..	
<b>3. PAPER TOWEL DISPENSER</b>		
Where Required:	Bobrick  Model: B-26212  Mounting: Surface.	No Image

SECTION 10 28 00 TOILET ACCESSORIES

<b>4. PAPER TOWEL DISPENSER</b>		
Where Required:	<p>Bobrick</p> <p>Model: B-2620</p> <p>Mounting: Surface.</p>	
<b>5. HAND DRYER</b>		
<p>Where Required:</p> <p>Locate in toilets where B-3644 are scheduled.</p>	<p>Bobrick</p> <p>Model: B-709</p> <p>115V, 20A, 2300 watts</p> <p>Mounting: Surface.</p>	
<b>6. GRAB BAR</b>		
<p>Where Required:</p> <p>Locate in public and staff toilets.</p>	<p>Bobrick</p> <p>Model: B-5806 x 36</p> <p>Mounting: Concealed with snap flange..</p>	
<b>7. GRAB BAR</b>		
<p>Where Required:</p> <p>Locate in public and staff toilets.</p>	<p>Bobrick</p> <p>Model: B-5806 x 42</p> <p>Mounting: Concealed with snap flange..</p>	

# SECTION 10 28 00 TOILET ACCESSORIES

<b>8. MIRRORS</b>		
Where Required:	Bobrick  Model: B-2908, sizes as shown  Mounting: Surface	
<b>9. MOP &amp; BROOM HOLDER</b>		
Where Required: Locate at mop sink in housekeeping closets.	Bobrick  Model: B-223 x 24  Mounting:	
<b>10. SHELF</b>		
Where Required: Locate at all Patient Showers.	Bradley  Model: 775 x 5"D x 12" L  Mounting: Surface	
<b>11. DIAPER CHANGING STATION</b>		
Where Required: Locate in all toilets except staff toilets.	Bobrick  Model: B-2210  Mounting: Surface	



SECTION 10 28 00 TOILET ACCESSORIES

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet accessories at the locations shown in accordance with manufacturer's recommended practice for attachment to metal or wood backing.

END OF SECTION



## SECTION 10 44 00 FIRE PROTECTION SPECIALTIES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide fire protection specialties in accordance with the Contract Documents.
- B. Where required:
  - 1.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data.

#### 1.3 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's catalog data indicating units to be furnished.

### PART 2 - PRODUCTS

#### 2.1 INTERIOR FIRE PROTECTION SPECIALTIES

- A. Standard Fire Extinguishers:
  - 1. Multi-purpose dry chemical type, UL rated 2A-10B:C, in enameled steel container with pressure-indicating gauge, for Class A, B and C fires. Red painted shell. Provide brackets for wall mounting.
- B. Fire Extinguisher Cabinets:
  - 1. Provide metal cabinet suitable for housing one fire extinguisher specified in Paragraph 2.1 A of this Section.
  - 2. Construction: Manufacturer's standard steel box with white bake enamel interior finish. Weld all joints and grind smooth. Miter and weld perimeter of door frames. Provide door with loop or lever handle and bullet catch.
  - 3. Cabinet types:
    - a. FEC1: Recessed cabinet with 5/16 inch projection flat frame and clear acrylic bubble glazing. No lettering. White baked enamel finish.
    - b. FEC2: Similar to FEC1 but flat glass.
    - c. FFEC: One-hour-rated. Cabinet, complete with extinguisher, same appearance as regular fire extinguisher cabinet, but constructed of double wall construction and furnished with testing laboratory label.
- C. Mechanical / Electrical Room Extinguishers: Regular dry chemical type, UL rated 40B:C. In enameled steel container with pressure indicating gauge for Class B and C fires. Red painted shell. Provide brackets for wall mounting.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install extinguishers in cabinets at locations shown with handle at 54 inches above floor. Securely fasten to partition, square and plumb in accordance with manufacturer's instructions.
- B. Install Mechanical and Electrical Room extinguishers with wall mount brackets. Locate top of extinguishers at 54 inches above floor.

END OF SECTION



## SECTION 10 51 13 METAL LOCKERS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide metal lockers in accordance with the Contract Documents.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.  
B. Section 01 25 13 - SUBSTITUTION PROCEDURES: Product Substitutions.  
C. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data Submittals.  
D. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's product data.

#### 1.3 SUBMITTALS

- A. Submittal Procedure: See Section 01 33 00.  
B. Product Data: Submit manufacturer's technical data, standard color chips and installation instructions for metal locker units.  
C. Samples: Submit duplicate samples of requested colors on same metal as used for locker fabrication. Samples shall be approximately 6 x 6 inches in size.  
D. Shop Drawings: Submit shop drawings for metal lockers, verifying actual dimensions affecting locker installations. Show method of installation. Include locker numbering sequence.

#### 1.4 JOB CONDITIONS

- A. Do not deliver metal lockers until building is enclosed and ready for locker installation. Protect from damage during delivery, handling, storage and installation.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide "quiet" lockers from one of the following manufacturers:
1. List Industries, Inc., "Whisper Quiet".
  2. Republic Storage Systems Company, "Quiet Lockers."
  3. Penco Products, Inc., "Guardian."

#### 2.2 LOCKER TYPES

LOCKER TYPES			
Tag	Size (inches WxDxH)	No.Tiers	Remarks
ML-01	12 x 15 x 18	4	Sloped Top . Cold-rolled metal base, 4 inches high, finished to match lockers. Flange bottom of base inward 3/4 inch for stiffening.
ML-02	12 x 15 x 24	2	Sloped top. Casework base.

- A. Handle and latch: Manufacturer's standard sound isolated latch with padlock lugs. One-point positive latching rod.  
B. Top: Sloped.

#### 2.3 FABRICATION

- A. Construction: All steel construction, 53 mil welded frame, 21 mil body and shelves, 53 mil doors, with concealed vents in tops and bottoms of doors. Provide filler trim as required.  
B. Finishing: Chemically pretreat metal with degreasing and phosphatizing process. Apply baked-on enamel finish to all surfaces, exposed and concealed, except plates and non-ferrous metal.

## SECTION 10 51 13 METAL LOCKERS

- C. Number Plates: Manufacturer's standard etched, embossed or stamped, non-ferrous metal number plates with numerals not less than 3/8 inch high. Number lockers in sequence. Where new are add to existing; number consecutively with existing lockers. Attach plates to each locker door, centered, with at least two fasteners of same finish as number plate.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install lockers at locations shown in accordance with the manufacturer's instructions and the shop drawings, level and true without gaps between lockers or spaces around lockers.
- B. Install trim where required or indicated, using concealed fasteners to provide flush, hairline joints against adjacent surfaces.
- C. Adjust doors and latches to operate easily without binding. Touch-up marred finishes, but replace units which cannot be restored to simulate factory finished appearance.

END OF SECTION

## SECTION 10 51 24 SOLID PHENOLIC LOCKERS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide custom solid phenolic lockers in accordance with the Contract Documents.
- B. Where Required
  - 1.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 25 13 - SUBSTITUTION PROCEDURES: Product Substitutions.
- C. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data Submittals.
- D. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's product data.
- E. Section 03 30 00 - CAST-IN-PLACE CONCRETE: for concrete base to receive Work of this Section.

#### 1.3 SUBMITTALS

- A. Submittal Procedure: See Section 01 33 00.
- B. Product Data: Submit manufacturer's technical data, standard color chips and installation instructions for metal locker units.
- C. Samples: Submit duplicate samples of requested colors on same metal as used for locker fabrication. Samples shall be approximately 6 x 6 inches in size.
- D. Shop Drawings: Submit Shop Drawings for solid phenolic lockers, verifying actual dimensions affecting locker installations. Show method of installation. Include locker numbering sequence.

#### 1.4 JOB CONDITIONS

- A. Do not deliver lockers until building is enclosed and ready for locker installation. Protect from damage during delivery, handling, storage and installation.

#### 1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver materials to Project Site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Store materials in a clean, dry area in accordance with manufacturer's instructions.
- C. Protect materials and finishes during handling and installation to prevent damage.

### PART 2 - PRODUCTS

#### 2.1 LOCKER TYPES

LOCKER TYPES			
Tag	Size (inches WxDxH)	No.Tiers	Remarks
PHL-01	12 x 12 x 12	6	Sloped Top. Concrete base.
PHL-02	20 x 20 x 87	1	Custom height. Sloped top. Concrete base.

- A. Handle and latch: Manufacturer's standard sound isolated latch with padlock lugs. One-point positive latching rod.
- B. Top: Sloped.
- C. Color: As selected by Architect from manufacturer's standard range.

#### 2.2 MATERIALS

- A. Panels: Solid phenolic composite panels made from decorative papers impregnated with melamine resin on faces with a clear protective overcoat and integrally compression molded with a core of solid phenolic impregnated kraft papers.
- B. Doors: 1/2-inch thick solid phenolic composite panels with rounded corners and chamfered edges.
  1. Provide stainless steel restraining bar to allow a maximum opening of 90 deg.

## SECTION 10 51 24 SOLID PHENOLIC LOCKERS

- C. Tops, Bottoms, and Shelves: 1/2 inch thick solid phenolic composite panels, dual ventilation slots.
- D. Sides: 3/8-inch thick solid phenolic composite panels, rough matte finish.
- E. Backs: 1/4-inch thick solid phenolic composite panels.
- F. Base: 8-inch concrete base installed under provisions of Section 03 30 00.
- G. Hinges:
  - 1. Type 304 stainless steel.
  - 2. Through-bolting at doors with stainless steel fasteners.
  - 3. Mounted to inside, invisible from outside of locker.
  - 4. Full Height Lockers: 3 hinges.
- H. Handle and latch: Manufacturer's standard sound isolated latch with padlock lugs.
- I. Coat Hooks:
  - 1. Locker manufacturer's standard.

### 2.3 FABRICATION

- A. Fabricate locker components square, rigid, with finish free of scratches and chips.
- B. Assemble lockers together with Type 304 stainless steel fasteners directly into solid phenolic composite panels.
  - 1. Aluminum or other metal profiles or reinforcements are not acceptable.
- C. Provide and install end panels, tops, shelves and filler panels as required for complete and finished installation.

### 2.4 NUMBER PLATES

- A. Manufacturer's standard etched, embossed or stamped, non-ferrous metal number plates with numerals not less than 3/8 inch high.
- B. Number lockers in sequence.
- C. Number consecutively as directed by Contracting Officer.
- D. Attach plates to each locker door, centered, with at least two fasteners of same finish as number plate.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install lockers at locations shown in accordance with manufacturer's instructions and approved Shop Drawings, level and true without gaps between lockers or spaces around lockers.
- B. Install trim where required or indicated, using concealed fasteners to provide flush, hairline joints against adjacent surfaces.
- C. Attach number plates to doors after lockers are in place. Attach number plates in sequence as directed by Contracting Officer.
- D. Touch-up marred finishes, but replace units which cannot be restored to simulate factory finished appearance.

### 3.2 ADJUSTING & CLEANING

- A. Adjust doors and latches to operate easily without binding.
- B. Clean surfaces in accordance with manufacturer's instructions.
- C. Do not use abrasive cleaners.

END OF SECTION



PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Provide and/or install miscellaneous equipment in accordance with the Contract Documents.
- B. The Miscellaneous Equipment Schedule lists equipment references on Drawings. The list includes Owner and Contractor furnished equipment and products, and is generally limited to items that require attachment, installation and/or utility services. *(It is also duplicated in Volume [insert Volume number] of the Project Manual which includes available catalog cuts of the equipment and products.)*

1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal of samples.
- C. Section 01 42 00 - REFERENCES: Equipment Status (Responsibility) - Definitions of abbreviations and nomenclature used herein.
- D. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Wall backing and wall recesses.
- E. Section 11 06 00 - MISCELLANEOUS EQUIPMENT SCHEDULE: Types, quantity and location.
- F. Division 22 - PLUMBING: Roughing-in and hooking up of all piping external of the equipment itself.
- G. Division 26 - ELECTRICAL: Roughing-in and connecting up of all electrical power connections external to the equipment.

1.3 QUALITY ASSURANCE

- A. Approved manufacturers are listed on the Miscellaneous Equipment Schedule. Prior approval by Owner required for all other manufacturers.
- B. Electrical Devices: Provide all electrical equipment with UL labels. UL labels shall be visible for inspection after installation is completed.
- C. Installer: Provide competent and experienced superintendent to supervise, coordinate and expedite the installation. Equipment suppliers shall cooperate with the Contractor to facilitate the installation and start up.
  - 1. The installation may require specialty trades. It is not the intent of this section to limit the work to any one installer. For the sake of clarity, equipment is grouped under one section.

1.4 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Manufacturer's Literature: Submit specifications and catalog information of all Contractor furnished equipment or products, with numbers correlated to the Equipment Schedule numbering.
  - 1. Submit request for information to obtain installation or rough-in information on existing equipment. If not available, examine equipment at present location to determine installation requirements.

1.5 PRODUCT HANDLING

- A. Protect equipment against damage from the time it is turned over to the Contractor and until Substantial Completion.
- B. Establish schedule for delivery of all Owner furnished equipment. Submit schedule to Owner in ample time to permit normal acquisition and delivery of equipment.
- C. Clean Up: Crates, cartons, wrappings and similar debris related to the equipment shall be removed from the site. Remove shipping labels from equipment after installation.
- D. Leave at least one copy of manufacturer's installation and operating instructions, which are normally supplied with units, for Owner's maintenance. Save all warranties included in equipment packing; complete mail-in cards and identify warranties with equipment numbers and unit serial numbers, and transmit to the Owner.

## SECTION 11 05 00 MISCELLANEOUS EQUIPMENT

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. See Section 11 06 00 for types, quantity and location.
- B. New FCIC Equipment: The equipment has been selected on the basis of the manufacturer's printed literature. The current specifications of the manufacturer, at time of bid, shall be the basis of quality and design. Any variations in the manufacturer's specifications shall be reported to the Architect, by the equipment supplier, for review by the Owner. The Owner shall have no obligation to accept equipment delivered to the site, which has been revised by the manufacturer without prior consent of the Owner.
- C. Existing Equipment: All existing equipment to be reinstalled shall be assumed to be in working order, unless reconditioning is specified in the Miscellaneous Equipment Schedule. The Owner may purchase new replacement equipment or repair existing as required to put it in working order.

#### 2.2 MATERIALS

- A. Stainless Steel Fabrications:
  - 1.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install equipment in accordance with the manufacturer's installation instructions. Securely anchor units to adjacent walls and floors with concealed anchors, as applicable.
- B. The installation of equipment may require several trades. Workers performing the installation shall be skilled at the particular tasks they are performing.
- C. The installation and performance standards as specified throughout the project manual, shall apply to the Work of the Section, to the extent that specialty trades, operations or functions are required to install the equipment.

END OF SECTION

## SECTION 11 24 20 ROOF-MOUNTED MAINTENANCE EQUIPMENT

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Work of this Section includes the design, supply and installation of window cleaning/suspended maintenance equipment.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 50 00 – TEMPORARY FACILITIES & CONTROLS: for unloading and hoisting of equipment to roof.
- C. Section 03 30 00 – CAST-IN-PLACE CONCRETE: for cast-in-place concrete, including installation of embedded items.
- D. Section 03 45 00 – ARCHITECTURAL PRECAST CONCRETE: for pre-cast concrete.
- E. Section 05 12 00 – STRUCTURAL STEEL: for structural steel.
- F. Section 05 12 13 – ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS): for open web steel joists.
- G. Section 05 31 00 – METAL DECKING: for metal decking.
- H. Section 05 51 60 – **[insert]** for catwalks.
- I. Section 07 50 00 – **[insert]** for roofing.
- J. Section 07 62 00 – SHEET METAL FLASHINGS & TRIM: for flashing.
- K. Section 07 92 00 – JOINT SEALANTS: for sealants.
- L. Section 08 31 13 – ACCESS DOORS: for rigging access doors in walls.
- N. Section 08 80 00 – GLAZING: for guiding tracks or mullions on exterior of building.
- O. Division 23 – PLUMBING: for hot & cold water supply, faucets and drain at every roof level.
- P. Division 26 – ELECTRICAL: for three phase 208 volts, 60 Hertz service at every roof level and weatherproof power supply outlets with strain relief anchors.

#### 1.3 REFERENCES

- A. American Institute of Steel Construction (AISC):
  - 1. AISC S342L with Supplement No. 1, Load and Resistance Factor Design Specification for Structural Steel Buildings.
- B. American Iron and Steel Institute (AISI):
  - 1. AISI SG-971 with Supplement, Specification for Design of Cold-Formed Steel Structural Members.
- C. Aluminum Association (AA):
  - 1. AA ADM-1-Aluminum Design Manual, Aluminum Association.
- D. American Welding Society (AWS):
  - 1. AWS D1.1, Structural Welding Code – Steel.
- E. American National Standards Institute (ANSI):
  - 1. ANSI/IWCA I-14.1, Window Cleaning Safety Standard (International Window Cleaning Association).
- F. American Society of Mechanical Engineers (ASME):
  - ASME A120.1, Safety Requirements for Powered Platforms for Building Maintenance.

#### 1.4 DESIGN REQUIREMENTS

- A. Design window cleaning/suspended maintenance system to suit building and in accordance with plans, specifications, standards, and regulations/codes contained in Articles 1.3 and 1.7 of this Section.
- B. Locate anchorages to suit suspension equipment that will be used on building with respect to items such as reach, rigging, spacing, roof edge condition, and similar items.
- C. Design all anchor components to provide adequate attachment to building and suited to current window cleaning/suspended maintenance practices. Ensure compatibility with industry standard equipment.
- D. Ensure all anchor components conform to proper engineering principles and have been designed by a Professional Engineer qualified in the design of window cleaning/suspended maintenance equipment, its application and safety requirements.

## SECTION 11 24 20 ROOF-MOUNTED MAINTENANCE EQUIPMENT

- E. Design system fall arrest safety anchors and equipment supports to comply with the following structural requirements:
1. Supports for Suspended Platforms: davits, rigging sleeves and monorails are used for suspending a powered platform from storage and rigging/working locations on the building. These supports and the structures to which they are attached are typically designed to 1000 lbs (4.5 kN) vertical service load plus impact with a factor of safety as per AISC requirements and/or ACI or other applicable construction codes, and to 4 times the rated load against fracture or detachment (i.e. 4 to 1 stability factor).
  2. Fall Arrest Safety Anchors: designed to a maximum fall arresting force of typically 1800 lbs (8.0 kN) when wearing a body harness with a safety factor of 2 without any permanent deformation and to 5000 lbs (22.24 kN) against fracture or detachment.
  3. Ensure design of primary support equipment is capable of sustaining without failure at least four times the maximum static working load applied or transmitted to the components (i.e. a 4 to 1 stability factor).

### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Submit Shop Drawings showing complete layout and configuration of complete window cleaning/suspended maintenance system, including all components and accessories. Clearly indicate design and fabrication details, window "drops", hardware, and installation details.
- C. Shop Drawings to be reviewed by a professional engineer, and upon request, complete with calculations and/or test reports.

### 1.6 QUALIFICATIONS

- A. Manufacturer: Work of this Section to be executed by manufacturer specializing in the design, fabrication and installation of window cleaning systems having a minimum of 5 years documented experience.
- B. Loading and safety assurance: Work of this Section to meet requirements of governing codes and jurisdiction and to comply with properly engineered loading and safety criteria for intended use.
- C. Insurance: Manufacturer to carry specific liability insurance (products and completed operations) in the amount of \$2,000,000.00 to protect against product/system failure.
- D. Welding to be executed by certified welders in accordance with AWS requirements.

### 1.7 REGULATORY REQUIREMENTS

- A. Comply with the following OSHA regulations:
  1. 1910, Subpart D (Walking and Working Surfaces).
  2. Appendix C to 1910 Subpart F (Personal Fall Arrest Systems).
  3. "OSHA Ruling on Window Cleaning by Bosun's Chair" Memorandum to Regional Administrators from P.K. Clark, Director, Directorate of Compliance Programs.
  4. 1910.66, Subpart F (Powered Platforms).

### 1.8 MAINTENANCE DATA

- A. Submit under the provisions of Section 01 78 23.
- B. Submit 1 copy of system Equipment Manual & Inspection Log Book, with "Initial Inspection – Certification for Use" and "Inspection Sign-Off" forms completed.
- C. Submit 2 copies of a reduced plastic laminated as-built Shop Drawing showing equipment locations and details. This drawing is to be posted near exits onto the roof.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURER

- A. Basis of Design: Pro-Bel Enterprises LTD [www.pro-bel.ca](http://www.pro-bel.ca).

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- B. Other manufactured product meeting this specification may be substituted provided that manufacturers show proof of product insurance. Equipment details to be approved by Architect. Companies, such as miscellaneous equipment are not permitted to bid.

### 2.2 EQUIPMENT

- A.
- B.
- C.

### 2.3 SAFETY TIE-BACK ANCHORS

- A. Safety U-bars: **[Type 304 stainless steel with yield strength of 35 Ksi (240MPa)] [mild steel, Type 300W with yield strength of 44Ksi (300 MPa), hot dipped galvanized to ASTM A123/A 123M]**. U-bar to be not less than  $\frac{3}{4}$ " (19 mm) diameter material with 1-1/2" (38 mm) eye opening.
- B. Securement Bolts: mild steel, Type 300W with yield strength of 44Ksi (300MPa), hot-dip galvanized to ASTM A123/A 123M.
- C. Hollow Steel Section (HSS) Piers: mild steel, Type 300W with yield strength of 50 Ksi (350MPa). Wall thickness to suit application, **[hot dipped galvanized to ASTM A123/A 123M]** with Pro-Bel Protex 3/32 inch thickness, black colored, two-component TPU polyurethane/polyurea coating system.
- D. Base Plate and All Other Sections: **[galvanized][Pro-Bel Protex coated]** mild steel as above with yield strength of 44 Ksi (300 MPa). Thickness and securement to suit application.
- E. Flashing: in accordance with roofing membrane manufacturer's instructions.
- F. Miscellaneous Bolts, Nuts and Washers: mild steel, Type 300W with yield strength of 44 Ksi (300MPa), hot-dip galvanized to ASTM A123/A 123M, or Type 304 stainless steel with yield strength of 35 Ksi (240 MPa).

### 2.4 GROUND RIGGED DAVITS

- A. Davit Booms: Aluminum sections of engineered length and size to suit application, equipped with: carrying handles; **[stainless steel rolling trolley], [stainless steel friction trolley], [galvanized fixed shackle]** on outboard end; prominently displayed, non-corrosive data plate clearly stating Maximum Service Capacity of boom, Manufacturer's Name, Serial No. and Manufacturing Date; and designed to carry minimum vertical service load of 1,000 lbs (4.5 kN), i.e. rated load.
- B. Davit Masts: Round tubular **[aluminum][steel]** section capable of rotation through 360 deg, carrying handles; connecting pins.
- C. Davit Arms:
  - 1. Davits to be demountable, portable, capable of being easily and quickly broken down into pieces weighing no more than 80 lbs (36.3 kg) for ease of carrying.
  - 2. A davit or part of a davit weighing more than 80 lbs (36.3 kg) to be provided with a means for its transport, which shall keep the center of gravity of the davit at or below 36 deg above the safe surface during transport.
  - 3. Davits or davit components that require more than 80 lbs lifting effort to raise the arm into position to be provided with a mechanical means for hoisting them into position.
  - 4. Davit arm booms equipped with rolling trolleys or friction trolleys to have stops to ensure trolley cannot become detached from boom.
- D. Davit Bases: Round, hollow steel section piers of mild steel, Type 350W with yield strength of 50Ksi (350MPa), **[hot dip galvanized to ASTM A123/A 123M][with Pro-Bel Protex 3/32 inches thickness black colored two-component TPU polyurethane/polyurea coating system], [with][without] 3/4" diameter U-bar safety anchor, and securement to suit application.**
- E. Tethers: All pins and loose pieces to be secured using 1/8 inch stainless steel cable complete with easily inserted lead connectors to avoid loss.
- F. Plate and All Other Sections: **[Galvanized][Pro-Bell Protex coated]** mild steel as per davit bases above with yield strength of 44 Ksi (300 MPa).
- G. Flashing: in accordance with roofing membrane manufacturer's instructions.

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- H. Miscellaneous Bolts, Nuts and Washers: mild steel, Type 300W with yield strength of 44 Ksi (300MPa), hot-dip galvanized to ASTM A123/A 123M, or Type 304 stainless steel with yield strength of 35 Ksi (240 MPa).

### 2.5 ROOF RIGGED DAVITS

- A. Davit Booms: Aluminum sections of engineered length and size to suit application, equipped with: carrying handles; **[stainless steel rolling trolley][stainless steel friction trolley][galvanized fixed shackle]** on outboard end; prominently displayed, non-corrosive data plate clearly stating Maximum Service Capacity of boom, Manufacturer's Name, Serial No. and Manufacturing Date; and designed to carry minimum vertical service load of 1,000 lbs i.e. rated load.
- B. Davit Masts: Round tubular **[aluminum][steel]** section capable of rotating 360 deg, carrying handles; connecting pins; erection winch; turning handles; transport wheels.
- C. Davit Arms
1. Davits to be demountable, portable, capable of being easily and quickly broken down into pieces weighing not more than 80 lbs for ease of carrying.
  2. A davit or part of a davit weighing more than 80 lbs to be provided with a means for its transport, which shall keep the center of gravity of the davit at or below 36 inches above the safe surface during transport.
  3. Davits or davit components that require more than 80 lbs lifting effort to raise the arm into position to be provided with a mechanical means for hoisting them into position.
  4. Davit arm booms equipped with rolling trolleys or friction trolleys to have stops to ensure trolley cannot become detached from boom.
  5. Tail roof rigged davits shall be designed with hoisting winches to safely raise and lower arms and dolly wheels to roll davit arms into place.
- D. Davit Bases: Round, hollow steel section piers of mild steel, Type 350W with yield strength of 50 Ksi (350 MPa), **[hot dip galvanized to ASTM A123/A 123M][with Pro-Bel Protex 3/32 inches thickness black colored two-component TPU polyurethane/polyurea coating system]**, **[with][without]** 3/4 inch diameter U-bar safety anchor, and securement to suit application.
- E. Tethers: All pins and loose pieces to be secured using 1/8 inch stainless steel cable complete with easily inserted lead connectors to avoid loss.
- F. Plate and All Other Sections: **[Galvanized][Pro-Bel Protex coated]** mild steel as per davit bases above with yield strength of 44 Ksi (300 MPa).
- G. Flashing (For Davit Bases): Flashing to be in accordance with membrane manufacturer's recommendations.
- H. Miscellaneous Bolts, Nuts and Washers: mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M or Type 304 stainless steel with yield strength of 35 Ksi (240 MPa).

### 2.6 OUTRIGGER BEAMS

- A. Outrigger beams: **[aluminum I-beams][galvanized steel I-beams][galvanized hollow steel sections]** with non-corrosive, prominently displayed data plate clearly stating Maximum Service Capacity of beam, Manufacturer's Name, Serial No. and Manufacturing Date; and designed to carry minimum vertical service load of 1000 lbs; of engineered length and size to suit application complete with **[shackle][friction U-bar][trolley]** on outboard end. Beams equipped with rolling trolleys to have stops to ensure trolley cannot become detached from beam.
- B. Safety U-bars: **[Type 304 stainless steel with yield strength of 35 Ksi (240 MPa)][mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M-2000]**. U-bar to be not less than 3/4" (19 mm) diameter material with 1-1/2" (38 mm) eye opening.
- C. Outrigger base/roof anchor hollow steel section (HSS) piers: mild steel as above with yield strength of 50 Ksi (350 MPa). Wall thickness and securement to suit application, **[hot dipped galvanized to ASTM A123/A 123M-2000] [with Pro-Bel Protex 3/32" (2.4 mm) thickness, black colored, two component TPU polyurethane/polyurea coating system]**.

- D. Swivel-type beam bases: round hollow section (HSS) piers of mild steel, Type 350W with yield strength of 50 Ksi (350 MPa) **[hot dipped galvanized to ASTM A123/A 123M-2000] [Pro-Bel Protex coated]**; capable of easily rotating through 360° under load; with connecting pins; safety U-bar as above.
- E. Beam dolly: **[galvanized steel] [aluminum]** with pneumatic type rubber wheels, sized to suit beam.
- F. Tethers: all pins and loose pieces to be secured using 1/8" (3 mm) stainless steel cable complete with easily inserted lead connectors to avoid loss.
- G. Base plate and all other sections: **[galvanized] [Pro-Bel Protex coated]** mild steel as above with yield strength of 44 Ksi (300 MPa). Thickness and securement to suit application.
- H. Flashing: flashing to be in accordance with roofing membrane manufacturer's recommendations.
- I. Securement and Miscellaneous Bolts, Nuts and Washers: mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M or Type 304 stainless steel with yield strength of 35 Ksi (240 MPa).

## 2.7 MONORAILS

- A. Monorails and mounting: designed to carry minimum vertical service load of 1,000 lbs (4.5 kN); fabricated using **[aluminum extrusions to ASTM B221-2000 "Standard Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes"] [Cold rolled hollow steel sections, Type 350W with yield strength of 50 Ksi (350 MPa) and tensile strength of 65 Ksi (450 MPa), galvanized to ASTM A123/A 123M-2000 "Standard Specification for Zinc Coating (Hot-Dip Galvanizing) of Iron and Steel Products"]**.
- B. Monorail finish: exterior finish to be **[mill] [anodized] [galvanized] [polyester or polyurethane powder coated baked enamel of color as selected from manufacturer's standard colors or custom color]**. Interior finish to be **[epoxy] [hybrid powder coated] [enamel painted on site]**.
- C. Capacity/Data plates: rail entry systems to be equipped with prominently displayed, non-corrosive plate clearly stating Maximum Service Capacity, Manufacturer's Name, Serial No. and Manufacturing Date.
- D. Trolleys: equipped with heavy-duty rollers and 5/8" (16 mm) diameter U-bar safety anchors; **[exterior finish to be Type 304 stainless steel.] [Interior finish to be powder coated mild steel to match monorail.]** Design trolleys to run freely under load with minimum discontinuity at rail splices and provide end stops to ensure trolley cannot become detached from the rail. Stops to be removable for service.
- E. Safety U-bars: **[Type 304 stainless steel with yield strength of 35 Ksi (240 Mpa)] [mild steel, Type 300W with yield strength of 44 Ksi (300 Mpa), hot-dip galvanized to ASTM A123/A 123M-2000]**. U-bar to be not less than 3/4" (19 mm) diameter material with 1-1/2" (38 mm) eye opening.
- F. Securement bolts: mild steel, Type 300W with yield strength of 44 Ksi (300 Mpa), hot dipped galvanized to ASTM A123/A 123M-2000.
- G. Hollow steel section (HSS) piers: galvanized steel as above with yield strength of 50 Ksi (350 MPa). Wall thickness to suit application.
- H. Tethers: all pins and loose pieces to be secured using 1/8" (3 mm) stainless steel cable complete with easily inserted lead connectors to avoid loss.
- I. Base plate and all other sections: galvanized mild steel as above with yield strength of 44 Ksi (300 MPa). Thickness and securement to suit application.

## 2.8 RIGGING SLEEVES

- A. Safety U-bars: **[Type 304 stainless steel with yield strength of 35 Ksi (240 MPa)] [mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M-2000]**. U-bar to be not less than 3/4" (19 mm) diameter material with 1-1/2" (38 mm) eye opening.
- B. Securement Bolts: **[mild steel, Type 300W with yield strength of 44 Ksi (300 Mpa), hot-dip galvanized to ASTM A123/A 123M-2000] [Type 304 stainless steel with yield strength of 35 Ksi (240 Mpa)]**.

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- C. Straight suspension bars: 3/4" (19 mm) diameter mild steel with yield strength of 35 Ksi (240 MPa), hot-dip galvanized to ASTM A123/A 123M-2000.
- D. Hollow steel section (HSS) sleeves: galvanized mild steel as per 2.08, A. above with yield strength of 50 Ksi (350 MPa) of wall thickness to suit application, and as follows:
  - 1. wall mounted rigging sleeves: Fabricate with flip-up hinged door to accommodate push/pull outrigger.
  - 2. curved rigging sleeves: Bend with smooth radius finish to protect suspension or safety lines from chafing.
- E. Hollow steel section (HSS) piers: galvanized steel as above with yield strength of 50 Ksi (350 MPa). Wall thickness to suit application.
- F. Base plate and all other sections: galvanized mild steel as above with yield strength of 44 Ksi (300 MPa). Thickness and securement to suit application.
- G. Miscellaneous bolts, nuts and washers: mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M-2000 or Type 304 stainless steel with yield strength of 35 Ksi (240 MPa).

### 2.9 HORIZONTAL CABLE LIFELINE SYSTEM

- A. Hollow steel (HSS) pier supports: galvanized mild steel as above with yield strength of 50 Ksi (300 MPa). Wall thickness to suit application.
- B. Base plate and all other sections: galvanized mild steel as above with yield strength of 44 Ksi (300 MPa). Thickness and securement to suit application.
- C. Securement bolts: mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M-2000.
- D. Safety U-bars: **[Type 304 stainless steel with yield strength of 35 Ksi (240 MPa)] [mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M-2000].** U-bar to be not less than 3/4" (19 mm) diameter material with 1-1/2" (38 mm) eye opening.
- E. Seamless Spun Aluminum Flashing (For Steel Pier Supports): flashing to be in accordance with roofing members manufacturer's recommendations.
- F. Miscellaneous bolts, nuts and washers: mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot dipped galvanized to ASTM A123/A 123M-2000 or Type 304 stainless steel with yield strength of 35 Ksi (240 MPa).

#### "Hands-Free" Horizontal Lifeline System

- G. Cable: 5/16 inch dia., Type 316 stainless steel with minimum breaking strength of 19,125 lbs., complete with permanently swaged cable ends.
  - H. Data Plate: cable system entry points to be equipped with prominently displayed non-corrosive data plate clearly stating Maximum Service Capacity and Number of Users.
  - I. Standard intermediate support brackets: multi-position Type 316 stainless steel with reinforcing end caps and suitable for installation at any height. Secured using 1/2" (13 mm) dia. fasteners.
  - J. Mobile intermediate support brackets: multi-position, Type 316 stainless steel for working both sides of sloped roof at ridge point.
  - K. Corner units: manufacturer's standard 90 or 135 degree flexible corner units as required.
  - L. End terminal hardware: stainless steel swaged termination at one end and stainless steel tensioner with shock absorber at other end as required.
  - M. Lanyard cable runner: Type 316 stainless steel with automatic runner bypass for continuous "hands-free" operation that can be inserted or removed anywhere on the cable.
  - N. Harness: manufacturer's standard "hands-free" full body harness and lanyard complete with shock absorber.
- #### Double Lanyard (DL) Horizontal Lifeline System
- G. Cable: 5/16" (8 mm) dia. galvanized steel with minimum breaking strength of 19,125 lbs. (85 kN), complete with matching permanently swaged or mechanically swaged cable ends.
  - H. Data plate: cable system entry points to be equipped with prominently displayed non-corrosive data plate clearly stating Maximum Service Capacity and Number of Users.
  - I. Tensioner: steel turnbuckle, same material as cable.
  - J. Harness: manufacturer's standard full body harness with double lanyard and shock absorbers.



## SECTION 11 24 20 ROOF-MOUNTED MAINTENANCE EQUIPMENT

site conditions which would cause defective installation of products, or cause latent defects in workmanship and function.

- B. Verify site dimensions.
- C. Commencement of Work will imply acceptance of prepared work.

### 3.2 INSTALLATION

- A. Install equipment in accordance with approved Shop Drawings and manufacturer's recommendations.
- B. Co-ordinate installation with work of related trades.
- C. Install all work true, level, tightly fitted and flush with adjacent surfaces as required.
- D. Deform threads of tail end of anchor studs after nuts have been tightened to prevent accidental removal or vandalism.
- E. Manufacturer to assist and/or supervise installation of window cleaning/suspended maintenance equipment installed by others.
- F. Structural steel to receive safety anchors to have adequate bearing surface as indicated on Shop Drawings and/or to ensure 100 percent weld.

### 3.3 FINAL ADJUSTING & INSPECTION

- A. Adjust and leave equipment in proper working order.
- B. Complete "Initial Inspection – Certification for Use" form included in Equipment Manual & Inspection Log Book.

### 3.4 TESTING

- A. All anchors relying upon chemical adhesive fasteners to be 100 percent tested on site using load cell test apparatus in accordance with manufacturer's recommendations.

END OF SECTION



## SECTION 11 52 13 PROJECTION SCREENS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide projection screens in accordance with the Contract Documents.
- B. Where Required:
  - 1. Room 1037 Conference.
  - 2. Room 4077 Office.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data.
- C. Section 09 53 23 - METAL ACOUSTICAL CEILING SUSPENSION ASSEMBLIES: T-Bar framed ceiling openings.
- D. Division 26: Power wiring and conduit to remote control station.

#### 1.3 SUBMITTALS

- A. Manufacturer's Data: Submit manufacturer's product data, installation instructions, wiring diagram and maintenance instructions for screen surface.

### PART 2 - PRODUCTS

#### 2.1 MOTOR OPERATED SCREEN

- A. General: Furnish motorized projection screen for type of mounting shown, housed in baked enamel finished metal case with hanging hooks.
- B. Screen Fabric: Manufacturer's standard, flame and mildew-resistant, matte white surface with black masking borders. Black extra drop at top to extend bottom of screen to 3'-0" above floor.
- C. Motor: Instant reversing, gear drive motor of size and capacity recommended by screen manufacturer, with permanently lubricated ball bearings, automatic thermal overload protection, preset limit switches to automatically stop screen in "up" and "down" position, and positive stop action to prevent coasting.
  - 1. Single station control: Three position, UL listed control switch with metal device box and cover plate for flush wall mounting and for connection to 120 VAC electric power supply.
- D. Acceptable Products: Subject to requirements, furnish one of the following motor-in-roller-operated screens:
  - 1. Series 700 by Bretford Manufacturing Co.
  - 2. Cosmopolitan Electrol by Da-Lite Screen Co., Inc.
  - 3. "Targa," Draper Shade & Screen Co., Inc.
  - 4. "Electri Screen," Stewart Filmscreen Corp.
- E. Projection Screen Size H x W: 72 x 96 inches.
- F. Installation: Chain hung, above the ceiling.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION:

- A. Hang projection screens in accordance with manufacturer's instruction. Install level, plumb, secure and at proper height so bottom of screen is stored out of view. Furnish required hardware. Preset limit switches.
- B. Protect units so that they will be in perfect operating condition, without damage at completion of Project.

END OF SECTION



## SECTION 11 70 00 MEDICAL EQUIPMENT

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Coordination of medical equipment rough-in and installation.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 11 06 00 – MISCELLANEOUS EQUIPMENT SCHEDULE: Types, quantity and location of equipment.

#### 1.3 PRODUCT INSTALLED BUT NOT SPECIFIED UNDER THIS SECTION

- A. Section 01 10 00 - SUMMARY OF WORK: Owner furnished equipment.
- B. Section 11 06 00 – MISCELLANEOUS EQUIPMENT SCHEDULE: Types, quantity and location of equipment

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit for each product.
  - 1. Include data to indicate standard mounting and utility connection details.
  - 2. Include information for factory finishes, hardware, glass, sealants, accessories and other required components.
  - 3. Include color charts for color finished items indicating manufacturer's full range of colors available for selection.
  - 4. Include wiring diagrams and rough-in requirements for items requiring electrical connections.
- C. Shop Drawings: Provide for non-standard custom-fabricated items.
  - 1. Indicate typical layout including dimensions, mounting locations and sizes, service accesses, utility connections, mounting sequences, and division of installation responsibilities.
  - 2. Submit detail drawings of non-standard mounting details and utility connections.
  - 3. Submit detail drawings of special accessory components not included in manufacturer's product data.
- D. Informational Submittals: Submit following packaged separately from other submittals:
  - 1. Manufacturer's Instructions: Manufacturer's printed installation instructions.
  - 2. Manufacturer's Field Reports: Written results and findings of manufacturer's field services specified as part of Field Quality Control.  
Provide when required by product description.
- E. Closeout Submittals: Submit following in accordance with Section 01 77 00.
  - 1. Operation and Maintenance Data: Manufacturer's written, recommended operation and maintenance data.
  - 2. Warranty.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section.
- B. Approved manufacturers are listed under Section 11 06 00. Prior written Owner approval required for all other manufacturers.
- B. Installer Qualifications:
  - 1. Acceptable to manufacturer with experience on at least five projects of similar scope.
  - 2. Provide competent and experienced superintendent
  - 1. Where required by manufacturer, provide factory-trained installers.

#### 1.6 PRE-INSTALLATION CONFERENCE

- A. Conduct pre-installation meeting in accordance with Section 01 31 19.
- B. Convene pre-installation conference 5 working days prior to commencing Work of this Section when specified under product description.
- C. Attendance required: Contractor, manufacturer's representative, and installer.

## SECTION 11 70 00 MEDICAL EQUIPMENT

- D. Agenda: Discuss and agree upon acceptable substrate and mounting conditions, preparatory Work, utility connections, and methods of installation.

### 1.7 SEQUENCING

- A. General: Sequence work in accordance with Section 01 31 13.
- B. Prior to fabrication of mounting plates, furnish mounting plate templates to trades installing structure to support mounting plates.
- C. Install mounting plates to structural supports prior to covering-up by subsequent construction operations.

### 1.8 WARRANTY

- A. Special Warranty: Prepare and submit in accordance with Section 01 78 36.
  - 1. Warrant installed products to be free from defects in material and workmanship for time period specified under product descriptions.

### 1.9 MAINTENANCE

- A. Service: Provide service and maintenance of specific products as specified under product descriptions for specified time period from date of Substantial Completion in accordance with Section 01 78 23.

## PART 2 – PRODUCTS

### 2.1 MEDICAL EQUIPMENT

- A. Refer to party responsible for installation listed under Section 11 06 00.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions under which Work is to be performed. Do not commence Work until unsatisfactory conditions have been corrected.
  - 1. Verify utility connections are installed at correct locations.
  - 2. Verify mounting brackets, plates, and supports are installed where required.
  - 3. Verify layout of Work before beginning installation.
- B. Commencement of installation constitutes acceptance of conditions by installer.
  - 1. Costs of any corrective Work after commencement of installation shall be sole responsibility of equipment installer.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturer's printed instructions.
- B. Install equipment plumb, level, square, and free from warp or twist while maintaining dimensional tolerances and alignment with surrounding construction.
- C. Refer to Equipment Item Index for:
  - 1. Mounting heights
  - 2. Mounting and anchoring details.

### 3.3 FIELD QUALITY CONTROL

- A. General: Comply with requirements of Section 01 45 00.

### 3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjusting: Adjust parts for smooth, uniform operation.
- B. Cleaning: Comply with Section 01 74 00. Remove protective covering from pre-finished items.
  - 1. Clean as recommended by manufacturer. Do not use materials or methods which may damage finish or surrounding construction.
  - 2. Touch-up minor surface coating damaged during installation; replace damaged units as directed by Architect.
- C. Protect finished Work in accordance with Section 01 50 00.

SECTION 11 70 00 MEDICAL EQUIPMENT

3.5 DEMONSTRATION

- A. Demonstration and Instruction of Owner's Personnel: Provide in accordance with Section 01 79 00.
  - 1. Demonstrate equipment operation, maintenance and trouble shooting procedures and techniques.
  - 2. Provide as specified under product descriptions.

END OF SECTION





## SECTION 12 20 00 WINDOW TREATMENTS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide window coverings in accordance with Contract Documents.
- B. Horizontal blinds: Except for rooms indicated to receive roller shades, provide blinds at all exterior windows except windows in lobbies, waiting rooms, vestibules and hallways. Provide blinds at interior relites where indicated.
- C. Roller shades: Provide roller shades at windows where indicated.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data, Samples, Shop Drawings.
- C. Section 09 06 00 - ROOM FINISH SCHEDULE: For rooms to receive window treatments.
- D. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Selected fabrics and colors.

#### 1.3 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Product Data: Submit catalog data on specified products for verification.
- C. Samples: Submit the following:
  - 1. Duplicate blind slats in specified color for verification.
  - 2. Samples of shade fabrics and colors for selection.
- D. Shop Drawings: Submit copies of Architect's plans, marked up to show proposed locations of operating controls prior to ordering.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Horizontal Blinds: Hunter Douglas CL82 micro-blinds with anti-static coating.
  - 1. Slats: 5/8" x 0.08" aluminum.
  - 2. Color: C974 Pearl.
  - 3. Safety Feature: "Break-Thru" safety tassels on cords.
  - 4. Special Provisions: Furnish blinds that will be out of reach with extra long wands and cords.
- B. Roller Shades: Chain drive clutch system Rollstar by Castec. [www.castec.com](http://www.castec.com).
  - 1. Mounting: Overhead.
  - 2. Operation: Manual with chain hold down, static mode.
  - 3. Shade orientation: Regular roll.
  - 4. Fabric: As scheduled under Section 09 06 10.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Take field measurements for all openings or from approved window wall and relite Shop Drawings.
- B. Install window coverings in manner indicated to comply with manufacturer's instructions. Position units level, plumb, secure and flush with mullions and jambs. Securely anchor brackets with two (2) screws per bracket. Provide brackets spaced per manufacturer's recommendations.
- C. Provide adequate clearance between jambs and window coverings to permit unencumbered operation.
- D. Protect installed units to ensure their being in dust free operating condition, without damage, blemishes or indication of use at completion of Project. Repair or replace damaged units as directed by Architect.

END OF SECTION



## SECTION 12 32 16 PLASTIC LAMINATE-CLAD CASEWORK

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide plastic laminate casework in accordance with the Contract Documents.
  - 1. Plastic laminate wainscot is included in this Section.
  - 2. Alternates: See Section 01 23 00 for alternates affecting Work under this Section.
- B. Cabinet hardware.
- C. Display cabinet hardware.
- D. Low-voltage light fixtures for display cabinet.
- E. Plastic-laminate-clad utility shelves.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 1 apply to Work of this Section.
- B. Section 01 25 13 - SUBSTITUTION PROCEDURES: Product Substitutions.
- C. Section 01 33 00 - SUBMITTAL PROCEDURES: Product data Submittals.
- D. Section 01 78 23 - OPERATION & MAINTENANCE DATA: Manufacturer's maintenance data.
- E. Section 05 50 00 - METAL FABRICATIONS: Steel countertop supports in gypsum board partitions
- F. Section 06 40 00 - ARCHITECTURAL WOODWORK: Nurses stations and reception desks.
- G. Section 06 61 16 - SOLID SURFACING FABRICATIONS: Solid Surfacing countertops and backsplashes.
- H. Section 09 06 10 - INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: Color selections.
- I. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Concealed backing for support of wall cabinets.
- J. Section 09 30 00 - TILING: Ceramic tile backsplashes.
- K. Section 09 65 00 - RESILIENT FLOORING: Resilient bases.
- L. Section 10 11 20 - TACKBOARDS: Tackboards mounted in casework.
- M. Section 10 21 23 - CUBICAL CURTAINS & TRACK: Shower curtains and ceiling-mounted track.
- N. Section 12 52 00 - UPHOLSTERED SEAT CUSHIONS: Upholstered seat cushions to be installed in plastic laminate-clad casework.
- O. Division 22 - PLUMBING: Coordinate plumbing requirements.
- P. Division 26 - ELECTRICAL: Coordinate electrical requirements.

#### 1.3 REFERENCES

- A. Architectural Woodwork Institute (AWI):
  - 1. Architectural Woodwork Quality Standards, 8th Edition, Version 1.0.
- B. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA LD 3, Standard for High-Pressure Decorative Laminates.

#### 1.4 QUALITY ASSURANCE

- A. Fabricator's Qualifications: The intent of the Contract Documents is to provide high quality plastic laminate casework. Approved fabricators are listed below. Other bidders shall submit a list of at least three installations of similar flush overlay casework with bids that are representative of fabricator's workmanship. Include references.
  - 1. Westmark Products, Inc., Tacoma, WA.
  - 2. Custom Interiors, Seattle, WA.
  - 3. Ritter Cabinet Manufacturing, Inc.
  - 4. Approved Substitutions.
- B. Reference Standards: AWI "Architectural Woodwork Quality Standards", 8th Edition. AWI references herein apply to this Standard.

## SECTION 12 32 16 PLASTIC LAMINATE-CLAD CASEWORK

### 1.5 SUBMITTALS

- A. Submittal Procedure: Section 01 33 00.
- B. Shop Drawings: Submit 11 x 17 inch Drawings with plans and elevations drawn at a scale of 1 inch equals one foot and enlarged Details drawn at a scale of 6 inches equals one foot of all assembled plastic laminate casework. Include roughing-in provisions for Work of other trades where applicable. Include color information on all laminates and edging. Identify all hardware to be provided on Drawings.
- C. Product Data: Provide hardware catalog cuts on all hardware Substitutions for approval.

### 1.6 PRODUCT HANDLING

- A. Protect casework during transit, delivery, storage and handling to prevent wetting, damage, soiling and deterioration.
- B. Do not deliver casework, until painting, wet Work, sanding and grinding, and similar operations which could have detrimental effects on casework, have been completed in installation areas.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Except as otherwise indicated, comply with following requirements for plastic laminate casework not specifically indicated as prefabricated or prefinished standardized products.
- B. Wood Moisture Content: Provide kiln-dried lumber with an average moisture content of 6 to 11 percent.
  - 1. Wood plates in contact with concrete: Kiln dried preservative pressure treated wood.
- C. Board Materials:
  - 1. Countertops and general: 45 pcf density, "Industrial Grade" particle board.
  - 2. Cabinet interiors: Melamine or polyester low pressure laminate over 45 pcf density particle board. Color, white.
- D. Plastic Laminate (Indicated as PL): NEMA LD3, Grade GP50. Provide forming grade where required. Backing sheets: Phenolic, 0.020 inch thick. Colors as scheduled in Section 09 06 10.
- E. Adhesive for Plastic Laminate: Manufacturer's standard product, type, grade and class best suited for purpose, except do not use PVA.
- F. Acrylic Sheet: Clear 1/4 inch glazing quality plexiglass, acrylite or equal.
  - 1. Aluminum channel edge: A. Geo. Diack Extrusion No. 673, 1-1/4 inch deep, 0.30 inch inside dimensional or equal.
- G. Glass: ASTM C 1036, clear float glass, Type I, Class 1, quality q3, 3/16 inch thickness.
- H. Edgings: 3 mm PVC, color as scheduled in Section 09 06 10 from "Woodtape" or "Canplast" available colors.

### 2.2 HARDWARE

- A. Slides:
  - 1. Standard drawer slides: Knappe & Vogt No. 1400 or No. 1429, Hettich No. FR602L, Blum 230M series or approved equal full extension slide with a minimum load rating of 75 pounds.
  - 2. File and large drawer slides: Knappe & Vogt No. 1485, Accuride No. 4032 or approved equal full extension slide with a load rating of 150 pounds.
- B. Pulls: Quality 811; US26D finish; provide one per drawer and door.
- C. Cabinet Hinges:
  - 1. Model RJ376 by Rockford Process Control.
  - 2. Number of hinges:
    - a. Provide two hinges for doors up to 36 inches high.
    - b. Provide three hinges for doors over 36 inches high.

## SECTION 12 32 16 PLASTIC LAMINATE-CLAD CASEWORK

- D. Keyed Locks: National C8103 with keyway as directed by Contracting Officer. Provide two (2) keys per lock. US26D.
  - 1. Key each room differently. Where more than one work station occurs in a room, key each work station differently.
- E. Electric Locks: Codelocks CL1000, 5-key electronic cabinet cam lock.
  - 1. 5-button keypad with one 4-digit master code, one 4-digit sub-master code, and one 4-digit user code.
  - 2. Battery power. Provide fresh batteries at Substantial Completion.
  - 3. Manufacturer's standard silver grey painted finish.
  - 4. Required Locations: Under-counter drawers at all Patient, Patient Observation, and Isolation Rooms.
- F. Grommets: As manufactured by Doug Mockett & Co., P.O. Box 3333, Manhattan Beach, CA 90266, (213) 318-2491. Hettich grommets or approved Substitution. Doug Mockett's numbers are basis of design.
  - 1. Wiring grommet: Provide two (2) EDP type at each work station. Color(s) as selected. Final location as directed by Contracting Officer.
- G. Cabinet Catches: Epco 592. Furnish all doors with magnetic catches to keep doors from banging.
- H. Shelf End Supports (Adjustable): White plastic coated metal clips.
- I. Hanging File System: Penda-flex frames at file drawers.
- J. Shelf Standards: Knappe & Vogt No. 87-187 with brackets to match shelving widths. Include accessory shelf rests for anchoring shelves securely to supports.
- K. Shelf Supports for Single Cantilevered Shelf: Doug Mockett & Co., SH5, white.
- L. Wainscot Moldings: Extruded clear anodized aluminum "J" moldings for 1/16 inch paneling.
- M. Wainscot Adhesive: DAP 2000 or equivalent panel adhesive.
- N. Coat Rod: 1 inch stainless steel pipe with stainless steel or white plastic escutcheons.

### 2.3 FABRICATION, GENERAL

- A. Quality Standards: Provide casework as indicated in the Contract Documents and in accordance with the following AWI Standards as applicable.
  - 1. Casework with concealed hinges and countertops: Section 400, flush overlay design, custom grade.
  - 2. Casework with exposed hinges and countertops: Section 400, reveal overlay design, custom grade.
- B. Measurements: Before proceeding with fabrication of casework required to be fitted to other construction, obtain measurements and verify dimensions and Shop Drawing details as required for accurate fit.

### 2.4 PLASTIC LAMINATE CASEWORK

- A. Construction: Flush overlay or reveal overlay design as appropriate, panel type construction. Drill interior cabinet side panels at 32 mm on center for shelf supports and hinge attachment.
  - 1. Base cabinets: 24 inches deep out to out unless otherwise indicated.
  - 2. Wall cabinets: 12 inches clear inside. Provide light valances where indicated. Overhanging doors without a valance is not acceptable.
  - 3. Knee spaces: Provide plastic laminate finished end panels at each side of knee spaces, unless otherwise indicated.
  - 4. Soffit panels: Provide plastic laminate-faced soffit panels, where shown, to close off space between top of wall cabinets and ceiling. Provide concealed supports to support panels. Where soffit panels terminate, except at walls, provide finished end panels on wall cabinets that extend to ceiling. Soffit panels shall not protrude through the ceiling and tops of cabinets shall not be exposed to the ceiling plenum.
  - 5. Countertops: Fabricate tops of one inch particle board, with 0.050 inch plastic laminate surface on exposed side and 0.020 inch balancing sheet on underside.

## SECTION 12 32 16 PLASTIC LAMINATE-CLAD CASEWORK

Backsplash shall be 4 inches high unless full height or other material is shown. Provide end splashes at walls. Provide 3/16 inch radius cove at base of backsplashes.

6. Edging: Provide 3 mm PVC edging on countertops, all doors, drawer fronts, shelves and cabinet side panels, heat and pressure laminated to edges.
7. Filler trim: Where required at cabinet front ends at walls, trim with flush filler (scribe) strips not over 1 inch width which shall be of same material and finish as other exposed work; scribe tightly to adjacent surfaces. When necessary finish on job to match adjacent surfaces.
8. Drawers: Sides per AWI. Provide stops at back of drawer cabinets to prevent drawer fronts from bumping against cabinet ends, partitions, tops or bottoms.
9. Cabinet backs: 1/2 inch minimum melamine-faced particle board.
10. Hardware: Provide hardware complete for proper installation and operation of casework. Any modification or deviation shall be approved in writing by the Contracting Officer prior to installation.
11. Shelving: Except where plastic laminate shelving is indicated, provide low pressure laminate particle board and edged with matching color PVC. Provide 3/4 inch thick particle board for shelves up to 30 inches wide and 1 inch thick for wider shelves.

### 2.5 ACRYLIC FABRICATION

- A. Cut materials with carbide blades with minimum 10 teeth per inch.
- B. Flame polish and buff all exposed edges.
- C. Acrylic Dividers: Kerf cabinet sides for acrylic dividers. Cover up exposed ends of kerfs with PVC edging.

### 2.6 DISPLAY CABINET HARDWARE

- A. Manufacturer: Häfelle.
- B. Aluminum Mounting Bars (for glass door): Clear satin anodized aluminum.

## PART 3 - EXECUTION

### 3.1 JOB CONDITIONS

- A. Provide such information and service as may be necessary for the proper coordination of the Work of other trades with the Work of this Section.
- B. If schedule permits, field measure all spaces to receive plastic laminate casework.

### 3.2 INSTALLATION

- A. Coordinate Work with that of other trades affected by this installation. Unless otherwise shown, provide supports and attachments to be incorporated into or added to Work, including framing, nailers, grounds and blocking.
- B. Provide a competent and experienced superintendent to supervise, coordinate and expedite the installation.
- C. Scribe and cut Work to fit adjoining Work, especially countertops and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor casework to anchors or blocking built-in or directly attached to substrates.
- E. Install the Work plumb, level, true and straight with no distortions. Shim as required using concealed shims.
- F. Install casework without distortion so that doors and drawers will fit openings properly and be accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
- G. At all plastic laminate sink counters, provide neat silicone sealant bead of compatible color between backsplash and countertop, where integrally coved backsplash cannot be provided.

SECTION 12 32 16 PLASTIC LAMINATE-CLAD CASEWORK

3.3 TOLERANCES

- A. Maximum Variation From Level or Plumb: 1/8 inch in any 8 feet.
- B. Maximum Variation From Level for Back-to-Back Hinges: Back-to-back hinges shall level one to the other plus or minus 1/16 inch maximum.

END OF SECTION





## SECTION 12 48 13 ENTRANCE FLOOR MATS & FRAMES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Roll-up mats in **[recessed]** **[surface-mounted]** frames.
- B. Entrance mats in **[recessed]** **[surface-mounted]** frames.
- C. Entrance tiles in **[recessed]** **[surface-mounted]** frames.

#### 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 03 30 00 – CAST-IN-PLACE CONCRETE: for slab depression **[grouting]** **[and]** **[filling]** for recessed mats **[and frames]**.
- C. Section 12 48 16 – ENTRANCE FLOOR GRILLES: for rigid foot grilles and frames.

#### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain floor mats **[and frames]** through one source from a single manufacturer.
- B. Accessibility Requirements: Provide installed floor mats that comply with Section 4.5 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)." [Sections 302 and 303 in ICC A117.1.

#### 1.5 PROJECT CONDITIONS

- A. At time of installation, ambient temperature and humidity shall be continuously maintained near that for Final Occupancy.

### PART 2 - PRODUCTS

#### 2.1 ROLL-UP MATS

- A. Basis-of-Design: As scheduled in Section 09 06 10, or submit comparable product by one of the following:
  - 1. American Floor Products Company, Inc.
  - 2. ARDEN Architectural Specialties, Inc.
  - 3. Balco, Inc.
  - 4. C/S Group.
  - 5. J. L. Industries, Inc.
  - 6. Kadee Industries, Inc.
  - 7. Matco International.
  - 8. Pawling Corporation; Architectural Products Division.

#### 2.2 ENTRANCE MATS

- A. Basis-of-Design Product: As scheduled in Section 09 06 10, or submit comparable product by one of the following:
  - 1. American Floor Products Company, Inc.
  - 2. ARDEN Architectural Specialties, Inc.
  - 3. Balco, Inc.
  - 4. C/S Group.
  - 5. J. L. Industries, Inc.
  - 6. Kadee Industries, Inc.
  - 7. Matco International.
  - 8. Pawling Corporation; Architectural Products Division.
- B. Resilient Link Mats: **[3/8-inch- (9.5-mm-)]** **[or]** **[7/16-inch- (11-mm-)]** thick, reversible **[vinyl]** **[rubber]** **[rubber-tire]** link mats with **[galvanized spring]** **[stainless]**-steel wire link rods, vulcanized edge-nosing trim, steel-reinforced end trim, and links consisting of

## SECTION 12 48 13 ENTRANCE FLOOR MATS & FRAMES

rectangular units or continuous strips in a **[heel-proof, solid-weave pattern with no openings between links] [heel-proof, close-weave pattern with openings between links not exceeding 1/8 inch (3 mm) wide by 1 inch (25.4 mm) long] [open-weave pattern with openings between links about 1/2 inch (13 mm) wide by 1 inch (25.4 mm) long]**

2.3

A.

2.5 CONCRETE FILL & GROUT MATERIALS

A. Provide concrete grout and fill equivalent in strength to cast-in-place concrete slabs for recessed mats and frames. Use aggregate no larger than one-third fill thickness.

2.6 FABRICATION

A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning.

1. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes.

2. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.

B. Surface-Mounted Frames: As indicated for permanent surface-mounted installation, complete with corner connectors, splice plates or connecting pins, and post-installed expansion anchors.

C. Recessed Frames: As indicated, for permanent recessed installation, complete with corner pins or reinforcement and anchorage devices.

1. Fabricate edge-frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

D. Coat surfaces of aluminum frames that will contact cementitious material with manufacturer's standard protective coating.

2.7 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

C. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

[OR - Select]

C. Class II, Color Anodic Finish: AA-M12C22A32/A34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.

2.8 COPPER-ALLOY (BRONZE) FINISHES

A. Finish designations prefixed by CDA comply with the system established by the Copper Development Association for designating copper-alloy finishes, as defined in NAAMM's "Metal Finishes Manual for Architectural and Metal Products."

1. Remove tool and die marks and stretch lines or blend into finish.

2. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

## SECTION 12 48 13 ENTRANCE FLOOR MATS & FRAMES

### PART 3 - EXECUTION

- B. CDA Mechanical Finish Designation: [**M11, specular, as fabricated**] [**M32, directionally textured, medium satin**].

#### 3.1 EXAMINATION

- A. Examine substrates and floor conditions for compliance with requirements for location, sizes, [**minimum recess depth,** ] and other conditions affecting installation of floor mats and frames
- B. Do not proceed until unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install recessed mat frames to comply with manufacturer's written instructions. Set mat tops at height recommended by manufacturer for most effective cleaning action; coordinate top of mat surfaces with bottom of doors that swing across mats to provide clearance between door and mat.
  - 1. For installation in terrazzo flooring areas, provide allowance for grinding and polishing of terrazzo without grinding surface of recessed frames. Coordinate with other trades as required.
  - 2. Install necessary shims, spacers, and anchorages for proper location and secure attachment of frames.
  - 3. Install grout and fill around frames and, if required to set mat tops at proper elevations, in recesses under mats. Finish grout and fill smooth and level.
- B. Install surface-type units to comply with manufacturer's written instructions at locations indicated; coordinate with entrance locations and traffic patterns.
  - 1. Anchor fixed surface-type frame members to floor with devices spaced as recommended by manufacturer.

#### 3.3 PROTECTION

- A. After completing frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring.
- B. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION



## PART 1 - GENERAL

## 1.1 SECTION INCLUDES

- A. Upholstered seat cushions in accordance with the Contract Documents.
- B. Where Required: Rooms 1024, 1025, 1166, 1167, and 1171.

## 1.2 RELATED SECTIONS

- A. Drawings, General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 – SUBMITTAL PROCEDURES: for submittal procedures.
- C. Section 09 06 10 – INTERIOR ARCHITECTURAL COLORS & MATERIALS SCHEDULE: for selected patterns and colors.
- D. Section 12 32 16 – PLASTIC LAMINATE-CLAD CASEWORK: for plastic laminate-clad casework to receive upholstered seat cushions.

## 1.3 SUBMITTALS:

- A. Submit under the provisions of Section 01 33 00.
- B. Mock-Up: Submit sample cushion with fabric and seams as specified. Do not proceed with fabrication of other units until sample is approved.
  - 1. Approved sample may be used in finished Work.

## PART 2 - PRODUCTS

## 2.1 MATERIALS:

- A. Vinyl Fabric: As scheduled in Section 09 06 10.
- B. Cushion Construction: High density polyurethane foam, 2.25 pounds per cubic foot; wrap with 3/4 ounce Dacron; as "slip sheet."
  - 1. Use thread recommended by fabric manufacturer for long life under rigorous use, Dacron, Nylon or better.

## 2.2 FABRICATION:

- A. Obtain field measurements prior to fabrication. When field measurements are not possible, obtain measurements from approved casework Shop Drawings.
- B. General: All upholstery fabric shall be installed in same direction with pattern to match adjacent cushions.
  - 1. Back, top, face and bottom of cushions shall be one continuous piece of fabric joined by zipper on back edge. Box ends with top stitch.
- C. Cushion design:
  - 1. Fabricate cushions with 1/2 inch bullnose edges.
  - 2. Cushions to be loose and reversible.
  - 3. Core construction: 3 inch thick seats.

## PART 3 - EXECUTION

## 3.1 INSTALLATION:

- A. Deliver seat cushions to Project Site as directed.

END OF SECTION



## SECTION 13 13 00 AQUARIUMS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Aquariums as indicated in the Contract Documents.
- B. Fresh water or salt water tanks as selected by Owner.
- C. Aquarium accessories and aquatic life.
- D. Fish stock as selected by Owner.
- E. Work of this Section is delegated design.

#### 1.2 RELATED SECTIONS

- A. General Conditions and Division 01 apply to Work of this Section.
- B. Section 01 33 00 - SUBMITTAL PROCEDURES: Submittal procedures.
- C. Section 01 36 00 - DELEGATED DESIGN REQUIREMENTS: for requirements of Bidder-designed Work.
- D. Section 06 40 00 - ARCHITECTURAL WOODWORK: for architectural woodwork to receive Work of this Section.
- E. Division 22 - Plumbing: for plumbing rough-ins.
- E. Division 26 - Electrical: for electrical rough-ins.

#### 1.3 QUALITY ASSURANCE

- A. Design Qualifications: Firm experienced in designing and fabricating aquariums similar to those required for this Project with 5 years documented experience.

#### 1.4 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Shop Drawings: Submit large scale plans, elevations and details of all assembled aquariums. Include method of attachment to architectural woodwork, seismic restraints, and rough-in provisions of Work of other trades where applicable. Include all necessary finishing information including product data, with Shop Drawing Submittal.
  - 1. Contractor shall submit simultaneously with Shop Drawings for Work of Section 06 40 00.
- C. For coordination purposes, submit anticipated finished weight for each aquarium unit.

#### 1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver aquarium units to Project Site in such quantities and at such times to assure continuity of installation. Store units at Project Site to prevent cracking, distortion, staining or other physical damage and so that markings are visible. Lift and support units at designated lift points.

### PART 2 - PRODUCTS

#### 2.1 TANKS

- A. Provide aquarium tanks in sizes, and quantities indicated on Drawings.
- B. Tank Material: Acrylic.

#### 2.2 ACCESSORIES

- A. Filters, Submersible Pumps, Lights, Protein Skimmers, Electric Grounds, Etc.: As recommended by aquarium designer and as required for proper operation and maintenance of fresh water or salt water tanks as appropriate.

#### 2.3 FABRICATION

- A. Fabricate aquarium units complying with manufacturing and testing procedures, quality control recommendations and dimensional tolerances.

SECTION 13 13 00 AQUARIUMS

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify proper blocking and support are ready to receive Work of this Section.
- B. Verify other Work of the Contract Documents is ready to receive Work specified in this Section.

3.2 INSTALLATION

- A.

END OF SECTION



## SECTION 13 49 00 RADIATION PROTECTION

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide radiation protection in accordance with the Contract Documents.
- B. Where Required:
  - 1. Room 1062 Simulator 2 / HDR.
  - 2. Room 1028 Radiation Therapy-3.
  - 3. Room 2026 X-Ray.
  - 4. Room 2032 X-Ray.
  - 5. Room 2296 CT.
  - 6. Room 2299 CT.
  - 7. Room 3117 X-Ray.

#### 1.2 RELATED SECTIONS

- A. Section 01 33 00 - SUBMITTAL PROCEDURES.
- B. Section 08 11 13 - STEEL DOORS & FRAMES: Steel frames to receive radiation protection.
- C. Section 08 14 16 - FLUSH WOOD DOORS: Flush wood doors to receive radiation protection.
- D. Section 08 71 00 - HARDWARE.

#### 1.3 REFERENCES

- A. American Society for Testing and materials (ASTM)
  - 1. ASTM C1396, Standard Specification for Gypsum Board.
- B. National Council on Radiation Protection and Measurement (NCRPM)
  - 1. Report No. 49, Structural Shielding Design for Medical Use of X-Rays and Gamma-Rays of Energies up to 10 MeV.
  - 2. Report No. 79, Neutron Contamination from Medical Electron Accelerators.
  - 3. Report No. 147, Structural Shielding Design for Medical X-Ray Imaging Facilities.
  - 4. Report No. 151, Structural Shielding Design for Megavoltage X- and Gamma-Ray Radiotherapy Facilities.
- C. Atomic International (Vendor):
  - 1. Letter dated 9 May 2008, attached at end of this Section.
- D. Physicist Report:
  - 1. Structural Engineering and Evaluation Report for New Linac Vault at Multicare Regional Cancer care Center, prepared by Nisy Ipe, dated 26 Sep 2008, attached at end of this Section.

#### 1.4 QUALITY ASSURANCE

- A. Comply with requirements of NCRPM Report Nos. 49, 79, 147, and 151, as applicable to this Work.
- B. Installer: Prior experience on a minimum of two similar successful installations is required.

#### 1.5 SUBMITTALS

- A. Submit under the provisions of Section 01 33 00.
- B. Manufacturer's product data and specifications for each item of radiation protection material and accessory required by the Contract Documents.
- C. Shop Drawings: Submit Shop Drawings indicating location and thickness of lead radiation protection in compliance with Letter of Recommendations prepared by Health Physics Northwest, dated October 2007.
- D. Certificate of Compliance: At completion of Work of this Section, submit Certificate of Compliance prepared by radiation protection installer certifying that all materials and workmanship are in compliance with the requirements of the Contract Documents and the Report prepared by the Radiation Shielding Inspector.

## SECTION 13 49 00 RADIATION PROTECTION

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Lead Sheet: FS QQ-L-201f, Grade C, minimum thickness as indicated on Drawings or as required.
- B. Lead Laminated Gypsum Drywall: 5/8 inch gypsum board conforming to ASTM C1396, Type X, 4 feet wide by full length required. Laminate gypsum board permanently to lead sheet designed for continuous coverage of the protected areas.
- C. Glazing:
  - 1. Window glazing: 5/16 inch glass, rated equivalent to 2 mm lead as distributed by Ray-Bar Engineering Corporation, Azusa, CA, [www.raybareng.com](http://www.raybareng.com).
  - 2. Door glazing: "Saf-T-Lite" laminated lead glass, 1.59 mm lead equivalent by Amerope Enterprises, Inc., (800) 327-3320, [www.amerope.com](http://www.amerope.com).
- D. Lead Lined Doors: Flush type wood construction and finish as specified in Section 08 14 16. Fabricate door with lead laminated in center of core, or laminated to each side of core, and extended to outer edges.
  - 1. Acceptable manufacturers: Algoma Hardwoods, Inc., Marshfield Door Systems, Inc., VT Industries. Marshfield Door model numbers are listed below as Basis of Design:
    - a. WXR-1: Non-rated.
    - b. WXR-20: 20-minute rated.
  - 2. Lead thickness: Specify thickness in mm.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. General: Include lead sheet protection behind all electrical junction boxes, plumbing penetrations and other recesses occurring at walls which are used for radiation protection, as well as on and around all penetrations through protected surfaces of partitions.
- B. Gypsum Drywall Partitions: Install lead lined gypsum board with long dimension vertical. Use minimum 7 feet long boards to provide 7 feet high shielding. Provide lead battens at vertical joints to provide a minimum 1 inch overlap. Install 2 inch wide lead battens inside all metal studs. Secure lead lined gypsum board with bugle head self-drilling screws. Do not install gypsum board on backside of lead lined partitions until lead lining is completed and inspected.
- C. Lead-Lined Door and Relite Frames: Line inside of frames with full length unpierced strips of sheet lead of not less than same thickness as doors and walls in which frames are used. Form lead sheets to match contour of frame, continuous in each jamb. Form lead shields around areas prepared to receive hardware. Fabricate lead lining wide enough to maintain a 1 inch lap with lead of adjoining shielding unit.
- D. At Wood Doors: Provide lead lined doors at all locations shown to receive radiation protection. Shield cutouts for locksets with sheet lead lapping lead lining of locksets and door lining, of equal thickness as used in door.

#### 3.2 COMPLETION

- A. Site Inspection: Prior to applying gypsum panels to back face of radiation resistant interior walls, the Owner will employ a qualified radiation shielding inspector for field inspection of installed radiation-resistant materials.
- B. Adjusting Defective Work:
  - 1. Repair and replace Work found defective by radiation shielding inspector.
  - 2. Repair or replace products and surfaces damaged by Work in this Section.
- C. Protection of Installed Work: Tape temporary paper signs on radiation-resistant walls with the following text:

"ATTENTION - RADIATION PROTECTION WALL. DO NOT MOUNT EQUIPMENT ON THIS WALL WITHOUT COVERING PENETRATING FASTENERS WITH LEAD SHEET OF THICKNESS REQUIRED BY ORIGINAL CONTRACT DOCUMENTS."

END OF SECTION



Atomic International  
Routes 73 & 663  
P.O. Box 279  
Frederick, PA 19435  
Telephone [1] (610) 754-6400  
Facsimile [1] (610) 754-9098  
E-mail: atomic@ledite.com

#### EMAIL / FAX TRANSMITTAL

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<b>To:</b>	Mr. Ben Finney Skanska USA USA Building, Inc.	<b>Date:</b>	09 May 2007
		<b>Regarding:</b>	Tacoma General Hospital Two (2) Ledite® Accelerator Rooms One (1) HDR Room - Option 1 Budget Estimate
<b>Fax No.:</b>	406-248-3779	<b>Phone:</b>	406-248-7455
		<b># Pages:</b>	4 (including cover sheet)
<b>Email:</b>	ben.finney@skanskausa.com	<b>From:</b>	David P. Farrell

Dear Mr. Finney:

We are in receipt of your email dated 30 April 2007 containing Giffin Bolte Jurgens drawing A201 for the proposed shielding for Tacoma General Hospital located in Tacoma, WA. Based on this information, as well as Giffin Bolte Jurgens "Option 1" sketch dated 02 May 2007, we are pleased to provide the following budget estimate for the fabrication, delivery, and installation of two (2) Ledite® Accelerator Rooms and one (1) Ledite-HDR® room as indicated below.

#### BUDGET ESTIMATE

##### 1.0 Two (2) Ledite® Accelerator Rooms - Maze Entry

Furnish, deliver and install all Ledite® block shielding to construct walls and ceiling for two (2) free standing Maze Entry Ledite® Accelerator Rooms shielded for fully occupied conditions above. Walls and ceiling based on approximate interior dimensions of 21'-6" x 26'-0" x 10'-0". Rooms shall be guaranteed against any radiation streaming through joints or seams. Ledite® block shall be interlocking on all four edges and shall be laid up in multiple wythes as required to achieve specified wall thickness. Completed walls shall be coated on interior and exterior of room with fiberglass reinforced mastic to completely bond walls.

##### 2.0 HVAC, Electrical & Other Penetrations

- 2.1 Provide all necessary duct baffles and port openings for HVAC, plumbing and electrical penetrations as required.  
Note: All penetrations to be coordinated with Atomic International for proper location and design to ensure against radiation streaming.

- 2.2 Provide shielding and grouting as necessary for physics cable pass through. General Contractor to supply and install, at required location, a 4" PVC pipe or other passage as required by physicist and/or contract drawings. Atomic shall be responsible for shielding around pass through pipes etc. as required. General Contractor to coordinate all penetrations with Atomic.

### **3.0 Support Structure**

- 3.1 Provide all necessary structural beams, steel bearing plates, reinforcing bar, clips, fasteners, etc. as required to construct structural ceiling support for Ledite® ceiling shielding. Ceiling structure shall be set to provide an approximate 10'-0" height to underside of structural steel support system.

### **4.0 Engineering**

- 4.1 Atomic shall provide complete installation drawings, recommendations and design assistance to construct two (2) shielded Ledite® Accelerator Rooms and one (1) shielded Ledite® HDR Room as described herein. Note: It is the customer's responsibility to secure all necessary permits, licenses, architectural and engineering services and approvals by federal, state or local regulators as may be required.
- 4.2 All Ledite® Medical Linear Accelerators and HDR Facilities are designed per the recommendations of National Council on Radiation Protection Guidelines - Handbooks 49, 51, 79 & 151. Unless specifically stated in writing prior to design, the NCRP Guidelines and Atomic International's Testing Protocol shall serve as the basis for all radiation protection design, testing, and acceptance procedures.

### **5.0 Shieldray® Door**

- 5.1 Furnish two (2) Shieldray® Neutron Doors (Maze Entry, swing) Model XN-5000 with approximate clear opening dimensions of 4' 0" wide x 7' 0" high for the linear accelerator rooms in item 1.0. Radiation shield doors shall provide protection for the energy produced by the accelerator as well as associated neutron production. Door shall be complete with radial thrust, ball bearing hinges and shielded frame. Door hardware shall be provided and installed by others (local contractor) to match existing hardware or as otherwise specified. Door is factory painted with two coats of rust inhibitive primer. All finishes to be by others.
- 5.2 Provide one electro-mechanical door operator for each item listed in 5.1 above. Operator shall have provision for manual operation in the event of power failure; and shall be complete with travel limits, and two (2) standard control push button stations.
- 5.3 All wiring and wiring materials, including conduit rough-in to the operator or any other accessory to the door drive to be provided and installed by others. Please verify wiring requirements from Atomic International. Atomic International will provide the required push buttons, safety sensors, etc. It would be the responsibility of others to provide the wiring and connection of these items. Please refer to Atomic International construction documents for verification of requirements

## 6.0 General

- 6.1 It is the customer's responsibility to ensure the radiation producing equipment, shielded facility and areas around the accelerator and HDR rooms are used within the parameters as set forth in the design. The shielding design parameters should include machine workload, use, occupancy, permissible exposure design limits, dose output, etc.
- 6.2 General contractor to supply temporary power, lighting, heating and water supply in close proximity (approximately 50') to the installation site. Reasonable access to the site must be provided. Reasonable access assumes steel beam supports, palletized material weighing approximately 4,000 lbs. ea., with dimensions of 42" x 36" x 30" H may be transported through corridors, doorways, elevators, etc. using conventional material handling equipment (carts, electric pallet lift, forklift etc.) as necessary. Protection of floors, carpets, tile, plumbing/electric stub-up fixtures, walls etc. is the responsibility of owner/general contractor. Owner/General Contractor to provide structural covering of the accelerator pit area to accept loads as outlined above prior to Atomic's arrival on site.
- 6.3 Atomic International shall provide a field supervisor periodically during the course of installation to inspect construction in an effort to ensure against defects and guarantee shielding integrity. Frequency and duration of inspections shall be at Atomic's discretion.

## 7.0 One (1) Ledite® HDR Room - Direct Entry

Furnish, deliver and install all Ledite® block shielding to construct walls and ceiling for one (1) free standing Direct Entry Ledite® HDR Room shielded for fully occupied conditions above the HDR room. Walls and ceiling based on approximate interior dimensions of 19'-0" x 19'-0" x 10'-0". Room shall be guaranteed against any radiation streaming through joints or seams. Ledite® block shall be interlocking on all four edges and shall be laid up in multiple wythes as required to achieve specified wall thickness. Completed walls shall be coated on interior and exterior of room with fiberglass reinforced mastic to completely bond walls.

- 7.1 Furnish one (1) Shieldray® HDR Door (Maze Entry, swing) Model X-3000 with approximate clear opening dimensions of 4' 0" wide x 7' 0" high for the HDR room in item 2.0. Radiation shield door shall provide protection for a 10 Ci (iridium 192) source. Door shall be complete with radial thrust, ball bearing hinges and shielded frame. Door hardware shall be provided and installed by others (local contractor) to match existing hardware or as otherwise specified. Door is factory painted with two coats of rust inhibitive primer. All finishes to be by others.
- 7.2 Provide one electro-mechanical door operator for item 7.1 above. Operator shall have provision for manual operation in the event of power failure; and shall be complete with travel limits, and two (2) standard control push button stations.
- 7.3 All wiring and wiring materials, including conduit rough-in to the operator or any other accessory to the door drive to be provided and installed by others. Please verify wiring requirements from Atomic International. Atomic International will provide the required push buttons, safety sensors, etc. It would be the responsibility of others to provide the wiring and connection of these items. Please refer to Atomic International construction documents for verification of requirements

## 8.0 Price & Delivery

8.1 The above items, 1.0 through 7.3 are estimated furnished, delivered and installed, excluding taxes if applicable for the sum.....\$985,000 to \$1,265,000.

This range can be further qualified upon receipt of further information about the site access and conditions, existence of any earth, concrete ceilings or walls etc. AS you can appreciate if earth backing or existence of concrete slabs etc. are factored into the shielding calculations the shielding requirements may be reduced. Likewise sequence of working at the site can impact installation and associated costs and schedule.

Delivery and installation times to be scheduled per mutual agreement.

Atomic International's Standard Terms and Conditions of Sale are referenced and enclosed, and would form part of a final proposal. Non-union labor rates apply. All prices quoted herein are exclusive of any taxes, fees, permits, etc. that may be required. All prices quoted herein are valid for a period of 30 days.

We appreciate your interest in our products and services, and thank you for the opportunity of working with you on your shielding requirements. If we can provide additional information or if you wish to discuss any items in more detail, please do not hesitate to contact us. Thank you.

Sincerely,

David P. Farrell

DPF/mtf

Attachment:: Atomic International Standard Terms and Conditions of Sale

**STRUCTURAL SHIELDING DESIGN AND EVALUATION REPORT  
FOR NEW LINAC VAULT AT MULTICARE REGIONAL CANCER CARE  
CENTER**

***Submitted by Physicist:***

**Nisy E. Ipe Ph.D., C.H.P.**  
3117 La Mesa Drive  
San Carlos, CA 94070  
Telephone and Fax: (650) 631-1916  
Email: nisy@comcast.net

***Date:***

**September 26, 2008**

***Architec/Designer:***

Kimberly L. Ritter  
GIFFIN BOLTE JURGENS  
815 S. W. Second Avenue, Suite 600  
Portland, Oregon 97204  
Phone (503) 223-0992  
Fax: (503) 294-3961  
Email: david.pugh@gbjarch.com  
[www.gbjarch.com](http://www.gbjarch.com)

***Designer:***

Brian Carter  
GIFFIN BOLTE JURGENS  
815 S. W. Second Avenue, Suite 600  
Portland, Oregon 97204  
Phone: (503) 223-0992  
Fax: (503) 294-3961  
Email: alberto.rinkevich@gbjarch.com  
[www.gbjarch.com](http://www.gbjarch.com)

***Medical Physicist:***

**Gary Hower, M.S.**  
1003 South 5<sup>th</sup> St  
M/S 315-L1-RAD  
Tacoma, WA 98405  
Phone: (253) 406-4992  
Fax: 253-403-4991

***Machine:***

**Varian Clinac iX, Trilogy™ Accelerator, 6 and 18 MV (BJR  
11) photons , 6, 9, 12, 15, 18 and 22 MeV electrons**

## 1.0 INTRODUCTION

The Multicare Regional Cancer Center will house one linear accelerator (linac). The facility is located above ground in a multi-storied building. The vault will house a Varian<sup>1</sup> Trilogy machine which will operate in the 6 and 18 MV photon modes with total workloads as specified in this report.

The drawings (Figures 1- 10) accompanying this report were provided by the architectural firm Giffin-Bolte-Jurgens. It is assumed that the drawings accurately represent the required shielding configuration and dimensions and shall be used for construction unless otherwise modified by the qualified physicist. **Since the designs for the door/door jambs and ducts have not been finalized, the report DOES NOT include door/door jamb design and duct design. However, thickness for the door are specified. Once the door/jamb design is finalized it shall be reviewed by a qualified physicist,**

This report shall be considered the final authority for the shielding evaluation of the new linac vaults. The architect and contractor shall read Sections 5 to 9.

## 2.0 ASSUMPTIONS

The following assumptions have been made in the preparation of this report:

### 2.1 Varian Linac

The shielded room will contain a modern isocentrically mounted linear medical accelerator. The accelerator will be dual photon energy, multi modality units equipped with multi-leaf collimators. The machine will not use a beam stopper.

The shielding calculations were made assuming that the accelerator is a Varian Trilogy™ accelerator operating at 6 and 18 MV photon modes.

The isocenter for the linac is located at 1m from the target and at a height of 51” from the floor. An X-ray head leakage of 0.1% is assumed based on Suggested State Regulations for Control of Radiation<sup>2</sup>. A neutron leakage of 2 mrem per photon rad at the isocenter for the 18 MV X-ray mode is assumed.

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<sup>1</sup> Varian Medical Systems, Palo Alto, CA Varian Radiation Leakage 206, Varian Medical Systems, Palo Alto, CA

<sup>2</sup> Suggested State Regulations for Radiation Control, Volume 1, Ionizing Radiation, U.S. dept. of Health and Services, Public Health Service, Food and Drug Administration (1987).



## 2.2 Workload

The Workload (W) is the degree of use of the radiation source and is expressed in terms of the weekly dose rate of the useful beam normally specified at a distance of one meter from the source or target.

### 2.2.1 Intensity Modulated Radiation Therapy (IMRT)

Conventional treatment planning generally models the composite dose distribution from directing uniform beams towards a target. The exception to this is the use of wedges and three-dimensional compensating filters. In intensity modulated radiotherapy (IMRT), beams with variable photon fluence across the aperture are calculated by inverse planning, with the potential to more precisely conform the high dose region to an irregularly shaped 3-D target and spare adjacent critical structures. Multi-leaf collimators are moved in and out of the treatment field to minimize dose to the critical structures. The resulting effect is that the number of Monitor Units (MU) delivered is increased by an IMRT factor, F, to get the same dose at the isocenter as from conventional therapy. The IMRT Factor depends on the IMRT procedure. Thus, the workload for the secondary barrier is increased by a factor of F. The effective workload for the primary barrier remains the same because even though the number of MU increases, the use factor for the primary barrier is decreased by about a factor of F from the use factor for conventional therapy.

The workload was provided by Gary Hower<sup>3</sup>. The number of treatment procedures per day are as follows:

#### 6 MV

40 treatments/day x 2/3 x 180 cGy/treatment x 5 days/week = 24,000 cGy/week

Out of these treatments 10% will be IMRT with an IMRT factor = 10

Therefore the primary beam workload at 6 MV = 24,000 cGy/week or rads/week at 1m

The secondary workload at 6 MV =  $(0.1 \times 10 + 0.9) \times 24,000 = 45,600$  rads/week at 1 m

It is assumed that 5 patients are treated in 1 h.

For the primary beam this corresponds to **900 rads in 1 h** and for the secondary barrier this corresponds to  $45,600/40 = \mathbf{3420 \text{ rads in 1 h}}$ .

#### 18 MV

40 treatments/day x 1/3 x 180 cGy/treatment x 5 days/week = 12,000 cGy/week

NO IMRT will be performed at 18 MV.

Therefore the primary beam workload at 18 MV = 12,000 Cgy/week or rads/week at 1m

The secondary workload at 18 MV = 12,000 rads/week at 1 m

It is assumed that 5 patients are treated in 1 h.

For the primary beam this corresponds to **900 rads in 1 h** and for the secondary barrier this corresponds to **900 rads in 1 h**.

---

<sup>3</sup> Medical Physicist, 1003 South 5<sup>th</sup> Street, MS 315-L1-RAD, T

## 2.3 Use Factors

The Use Factor is the fraction of time during which the beam is directed at a particular barrier. According to Gary However, the primary beam Use Factors shown in Table 2 will be used. The leakage use factors for the linac are 1.

**Table 2: Primary Beam Use Factor for Linac**

Walls	Use Factor Linac
Ceiling	0.34
Floor	0.34
Lateral	0.16

## 2.4 Occupancy Factors

The Occupancy Factor (T) for an area is the average fraction of time that the maximally exposed individual is present while the beam is on<sup>4</sup>. The Occupancy Factor, T for controlled areas is usually assigned a value of unity.

## 3.0 REGULATORY REQUIREMENTS AND DESIGN GOALS

1. Per Washington State Regulations WAC 246-221-010:  
The annual limit for Occupational Workers is the more limiting of:
  - (i) The total effective dose equivalent being equal to 0.05 Sv (5 rem); or
  - (ii) The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 0.50 Sv (50 rem).
2. Per Washington State Regulations WAC 246-221-055 the dose the dose equivalent to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, shall not exceed 5 mSv (0.5 rem).
3. Per Washington State Regulations WAC 246-221-060
  - a) the total effective dose equivalent to individual members of the public from the licensed or registered operation shall not exceed 1 mSv (0.1 rem) in a year
  - b) the dose in any unrestricted area from external sources, shall not exceed 0.02 mSv (0.002 rem) in any one hour.

Based on the above regulatory requirements, and recommendations of NCRP Report No. 151 the following design goals have been adopted:

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<sup>4</sup> NCRP Report No. 151

- A) A design goal of 10 mrem/week to an individual after application of Use and Occupancy Factors for Controlled Areas is used. For Controlled Areas the Occupancy Factor is 1.
- B) A design goal of 2 mrem/week to an individual after application of Use and Occupancy Factors for general public areas in Uncontrolled Areas is used.
- C) A design goal of 2 mrem in any 1 hour to an area (Uncontrolled) after application of Use Factor and Duty Cycle is used.

#### 4.0 SHIELDING DATA

The Tenth Value Layer is the thickness of the shielding material that when introduced in the path of radiation, reduces the dose rate by a factor of 10. Tenth Value Layers (TVLs) are taken from NCRP Reports 151, 51<sup>5</sup> and 79<sup>6</sup> and other sources for X-rays and neutrons, respectively.

The tenth value layers (TVL) shown in Table 3 used for shielding calculations are based on values in NCRP Report No. 151<sup>7</sup>, and from McCall<sup>8</sup> corrected for density. Concrete TVL of 8.27" and polyethylene TVL of 4.17" were used for neutrons. Neutron TVL for Ledite is 6.69".

**Table 3: Tenth Value Layers**

Material→	XN288		XN-240		Concrete <sup>9</sup> (NCRP 151)	
Density (PCF) →	288		240		147	
TVL →	Primary (")	Secondary (")	Primary (")	Secondary (")	Primary (")	Secondary (")
Energy (MV) ↓						
<b>6</b>	<b>7.15, 5.61</b>		<b>8.58</b>	<b>6.74</b>	<b>14</b>	<b>11</b>
<b>18</b>	<b>9.70, 8.93</b>	<b>7.66</b>	<b>11.64, 10.72</b>	<b>9.19</b>	<b>19, 17.5</b>	<b>15</b>

<sup>5</sup> NCRP 51, National Council on Radiation Protection and Measurements, "Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities, 1977, Bethesda, Maryland.

<sup>6</sup> NCRP 79, National Council on Radiation Protection and Measurements, "Neutron Contamination from Medical Accelerators", 1984, Bethesda, Maryland.

<sup>7</sup> NCRP151, National Council on Radiation Protection and Measurements, "Structural Shielding Design and Evaluation For Megavoltage X- and Gamma Ray Radiotherapy Facilities, 2005, Bethesda, Maryland

<sup>8</sup> R.C. McCall, Private data

<sup>9</sup> NCRP 151 values corrected for density

The TVLs for lead are 2.24 inches, at 6 and 18 MV. The TVLs for steel are 3.94" at 6 MV and 4.33 "at 18 MV, respectively.

Tables 4 and 5 show the scatter fractions, average energies and TVLs for concrete, XN-240 and lead as a function of scattering angle. Most of the data were obtained from NCRP Report No. 151.

**Table 4: Scatter Fractions at 1 m from a human-size phantom, target-to-phantom distance of 1 m, and field size of 400 cm<sup>2</sup>**

Angle (degrees)	18 MV	Average Energy (MeV)	TVL (") Concrete	TVL (") XN-240	TVL (") Lead
0		5			2.24
10	$1.42 \times 10^{-2}$	3.2			
15			17.32	10.61	
20	$5.39 \times 10^{-3}$	2.1			
30	$2.53 \times 10^{-3}$	1.3	12.60	7.72	
40		0.9			
45	$8.64 \times 10^{-4}$		10.63	6.51	
60	$4.24 \times 10^{-4}$		9.06	5.55	
50		0.6			
70		0.4			
75					
90	$1.89 \times 10^{-4}$	0.3	7.48	4.58	
105					
120					
135	$1.24 \times 10^{-4}$		5.91	3.62	
150	$1.20 \times 10^{-4}$				

**Table 5: Scatter Fractions at 1 m from a human-size phantom, target-to-phantom distance of 1 m, and field size of 400 cm<sup>2</sup>**

Angle (degrees)	6 MV	Average Energy (MeV)	TVL (") Concrete	TVL (") XN-240	TVL (") Lead
0		1.6			
10	$1.04 \times 10^{-2}$	1.4			
15			13.39	8.20	
20	$6.73 \times 10^{-3}$	1.2			
30	$2.77 \times 10^{-3}$	0.9	10.24	6.27	1.50, 1.73
40		0.7			
45	$1.39 \times 10^{-3}$		9.06	5.55	1.10, 1.34
60	$8.24 \times 10^{-4}$		8.27	5.06	0.75, 1.02
50		0.5			
70		0.4			
75					0.55, 0.75
90	$4.26 \times 10^{-4}$	0.3		4.10	0.39, 0.59
105					0.28, 0.47
120					0.20, 0.31
135	$3.0 \times 10^{-4}$		5.91	3.62	
150	$2.87 \times 10^{-4}$				

## 5.0 ARCHITECTURAL DRAWINGS AND CONSTRUCTION

1. All drawings provided by the architect represent the radiation treatment facility accurately. All shielding shall be constructed as shown in the figures of the shielding report.
2. The shielding report shall be made part of the construction report
3. All primary barriers will be centered on the isocenter and extend 1 foot beyond the primary beam cone with the collimator fully open, when the beam is pointed diagonally at the ceiling.
4. The linac is oriented as shown in the drawings of the shielding report. Note that any change in linac orientation will affect the effectiveness of the primary barrier shielding.
5. No change of the isocenter location or additional penetrations shall be made in the shielding without review by a qualified physicist.
6. The isocenter of the linac is located at a height of 51" above the floor for the linac
7. The contractor shall verify the location of the isocenter.
8. The isocenter shall be marked on the floors of the vaults and on the roofs.
9. There shall be no hollow structural support columns in the shielding walls.
10. All shielding joints shall be staggered, both horizontally and vertically.
11. It is assumed that all concrete including columns have an ultimate equilibrium (or dry) density of 147 lb/ft<sup>3</sup>. The contractor during construction shall verify the wet and dry densities for new concrete by performing on-site density testing. The contractor shall verify that the equilibrium density during the lifetime of the facility is at least 147 PCF. The contractor shall provide the mix details and theoretical wet and dry densities for the concrete. The contractor shall provide details of how density measurements will be made and process followed to ensure that ultimate dry density of minimum 147 PCF is met. The contract shall provide data on all density measurements. The physicist shall review theoretical mix, theoretical dry and wet densities and data on measured densities. Onsite density testing of 28-day cured cylinders should indicate design value that is higher than 147 PCF, since the concrete dries out with time. Alternatively oven dry density should be at least 147 PCF.
12. It is assumed that all existing concrete walls have a density of 140 PCF.
13. The concrete should have a water content of about at least 5%.
14. The contractor shall ensure that there are no voids in the concrete during the pour by using appropriate measures such as vibration of concrete.
15. Continuous pours are preferred for the concrete walls and ceiling.
16. For non-continuous concrete pours the contractor shall ensure that appropriate measures (such as sandblasting of poured surface before pouring the next portion, use of keyways, staggered joints, etc) to ensure that there are no thin spots at the cold joint. For non-continuous pours ceiling should be notched into lateral walls.
17. The Ledite blocks shall be staggered horizontally and vertically
18. For Ledite construction there shall be keyways at joints between XN-288 and XN-240. The keyways shall extend past the required Ledite XN-288 thickness. The keyways shall not interfere with the required Ledite XN-288 thickness, length or width.
19. **The Ledite walls shall be recessed into the floor and into the roof shielding as shown in the drawings.**

20. **The primary Ledite barriers will require horizontal steel plates, ½" thick, 3 feet wide and 15 feet long as shown in the figures.**
21. Gaps in the ceiling between the Ledite blocks and floor above shall be filled with equivalent density grout.
22. It is assumed that there is 0.25" of grout for every 6 inches of Ledite.
23. The maze wall extends from floor to ceiling and should be recessed into the shielding.
24. Before construction begins, the final construction/shop drawings for the facility (walls, roof, door and duct shielding) shall be reviewed and signed off by a qualified radiological physicist.
25. During construction a qualified radiological physicist shall verify that the shielding is in place per above signed drawings.
26. If architectural form ties are used, the holes left by the cones should be filled with high density grout (147 PCF)

## **6.0 PENETRATIONS**

1. Openings above the door will be used for HVAC, mechanical ducts, and plumbing and electrical into the linac room. The conduits and ducts shall follow the maze. The shielding design for the ducts shall be reviewed by a qualified physicist.
2. There shall be no penetrations that point directly to the isocenter or target.
3. If additional penetrations are required the qualified radiological physicist shall review them.
4. **Physicist's conduit will be required in secondary barriers adjacent to the control room.** The conduits shall be compounded 45 degrees both the horizontal and vertical plane. The physicist's conduit shall slope upwards towards the control room. Owner should verify location and configuration of physicist's conduit.
5. All other conduits should be taken under the floor slab and have double 90 degree bends as far as possible.
6. The duct shielding design shall be reviewed by a qualified physicist.

## **7.0 DOOR**

1. **The linac door is shielded with 2 inches of borated polyethylene (5% boron) and 1 inch of lead from inside vault to outside vault.** It is assumed that the doorframe is made of steel ¼ inch –thick on each side.
2. The contractor shall verify the 5% boron concentration for the borated polyethylene in the door.
3. The door jambs are constructed of concrete and shall have sufficient overlap with the door (6") to minimize neutron streaming through the door.
4. All gaps above and below the door are minimized and shall not exceed 1/4" in width.
5. All lead bricks shall be interlocking.
6. The door shall be provided with interlocks, kill switches and emergency power or battery back up.
7. There shall be NO lead sill under the door
8. **There shall be NO furring on the concrete column or the door jambs.**

**9. Once the door design is finalized a qualified radiological physicist shall review the door details and jambs between the door and linac walls.**

10. The contractor shall verify that appropriate door operators and hinges are used, and that hinges are hung correctly.
11. The contractor shall verify that door opening and closing times meet ANSI standards.
12. Owner shall specify other door requirements such as pressure sensors, etc.

**8.0 OTHER REQUIREMENTS**

1. The linac vaults shall be posted with “CAUTION X-RAY” signs.
2. The linac vaults shall be equipped with flashing red “BEAM ON” or warning lights.
3. The linac vaults shall be equipped with emergency off buttons.
4. The linac vaults shall be equipped with provisions such as CCTV and intercom for remote monitoring of and communication with the patient.

**9.0 SHIELDING REQUIREMENTS**

Figure 1 shows a partial floor plan for the linac vault. Figure 2 shows the second floor plan. Figure 3 shows a floor plan for the linac vault and the required shielding. Figure 4 shows a floor plan and the locations at which dose equivalents are calculated. Figures 5 and 6 show Sections R2 and R3 for the linac, respectively and the required shielding. Figures 7 and 8 show sections R2 and R3 and the locations at which dose equivalents are calculated. Figures 9 and 10 shows the ceiling plan for the linac vault and the required ceiling shielding. All details and dimensions are shown in the figures.

Figure 1: Partial Floor Plan

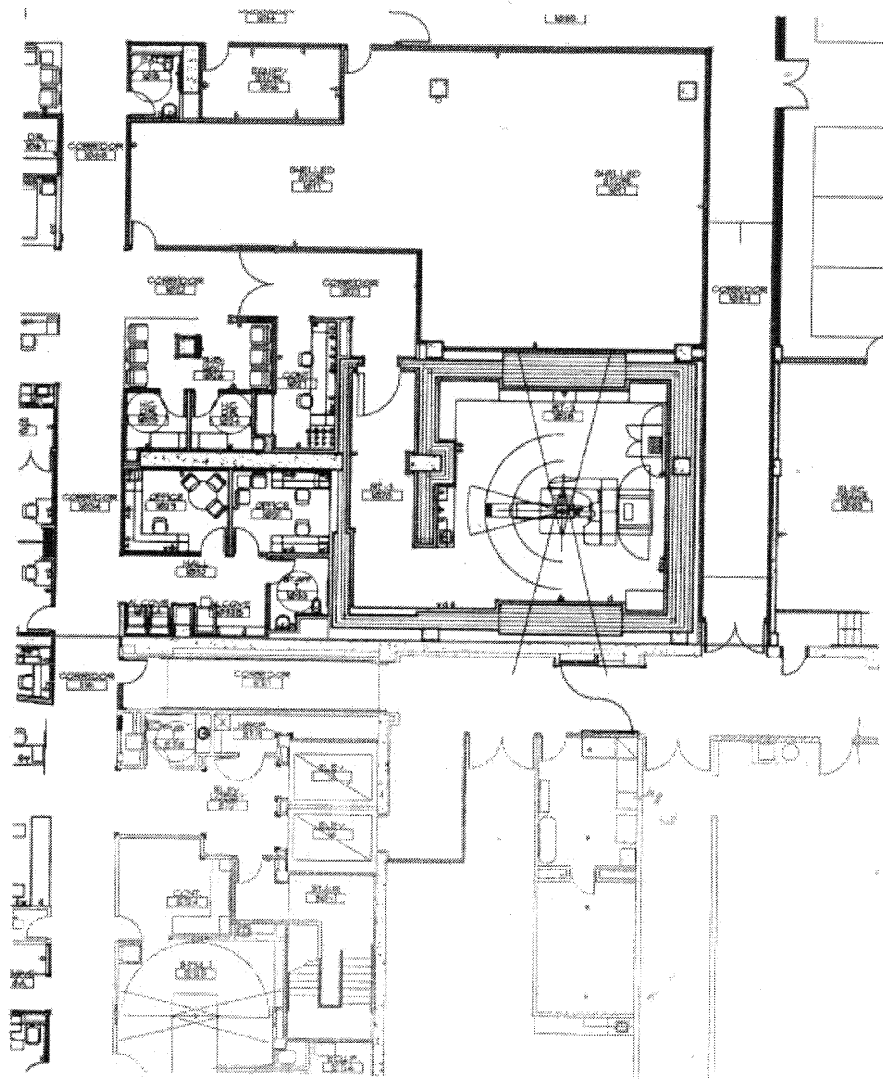


FIGURE 1

1st FLOOR  
LINAC Vault  $\frac{1}{16}'' = 1'-0''$



Figure 2: Second Floor Plan

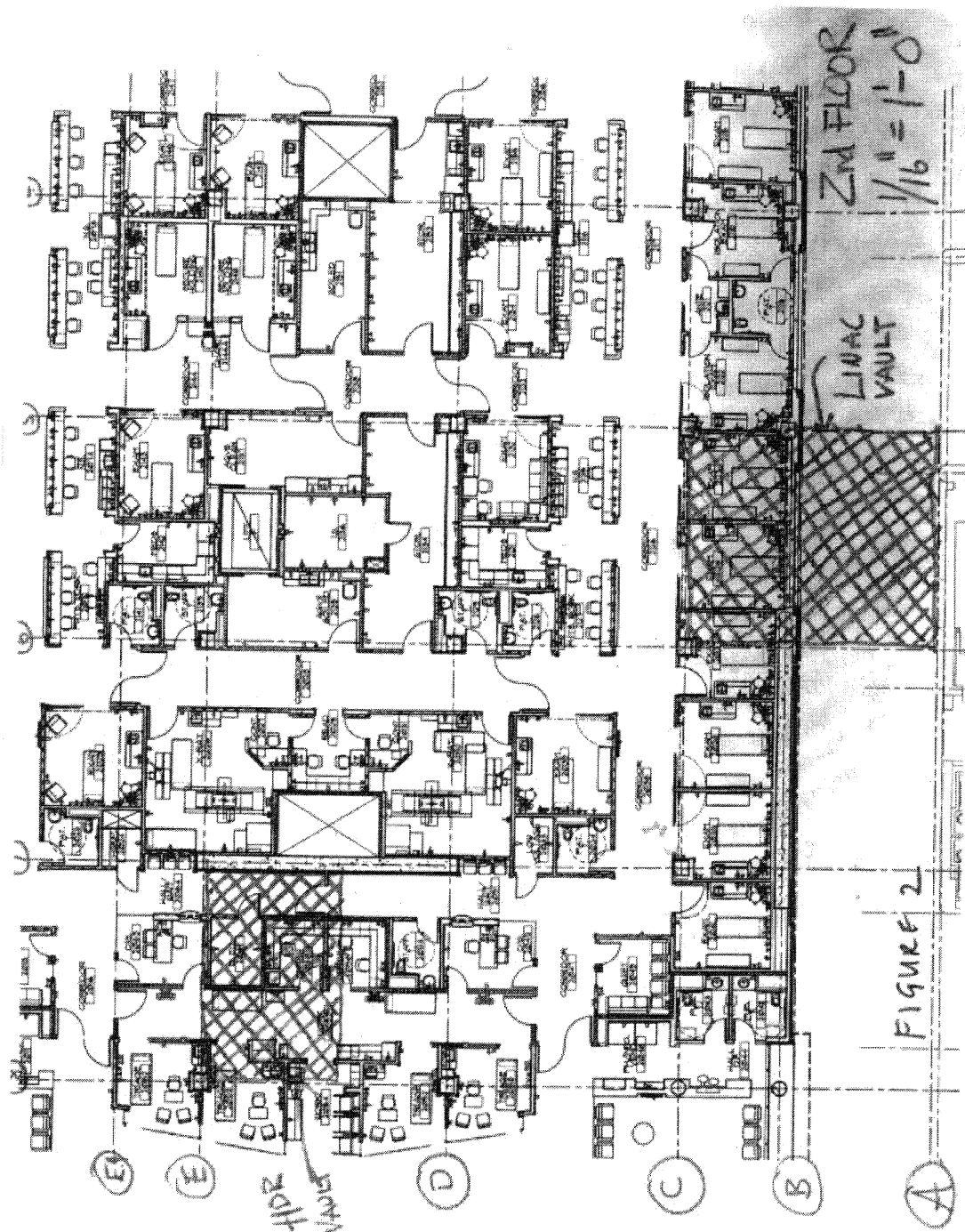


Figure 3: Floor Plan and Required Shielding

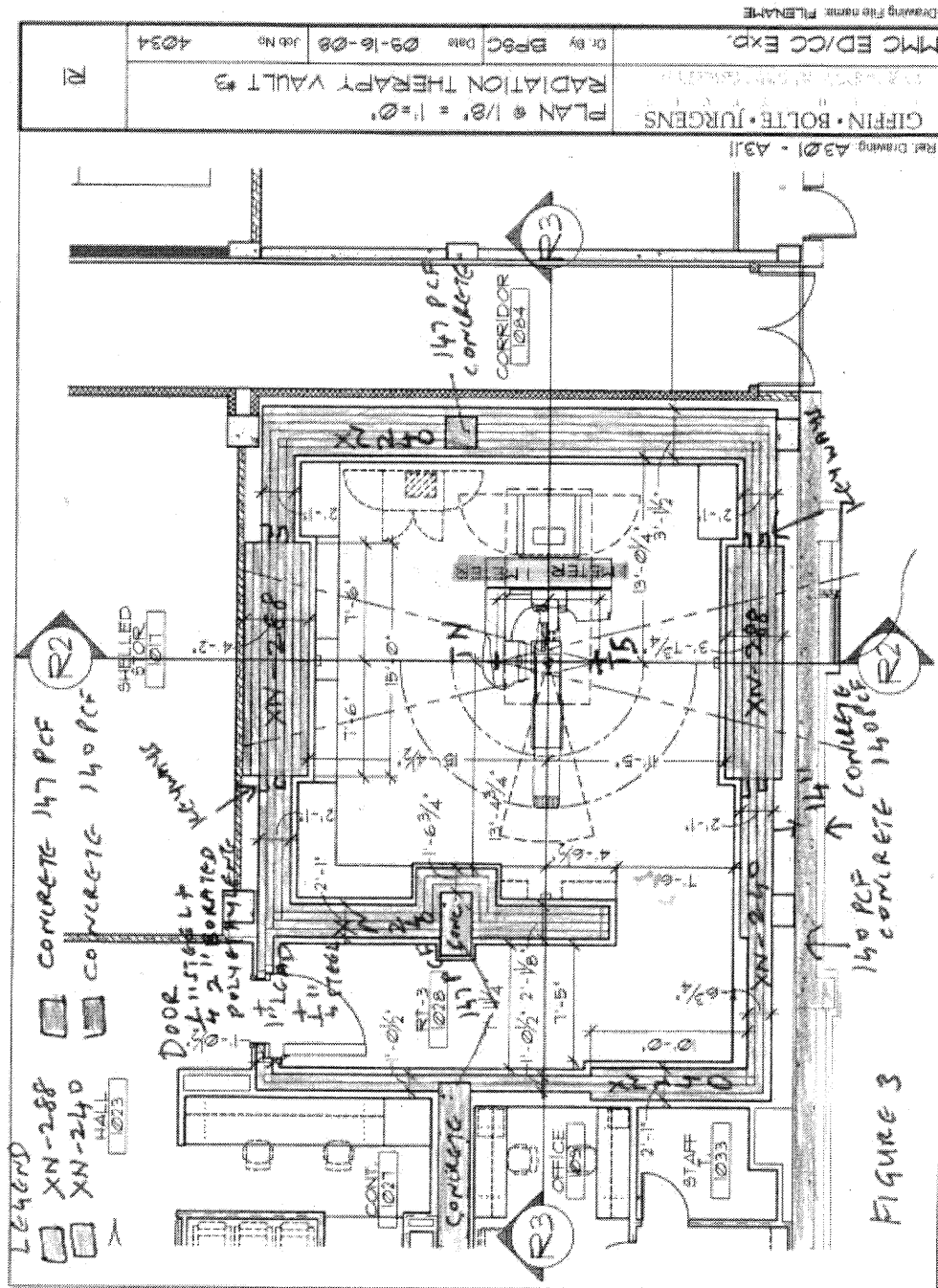
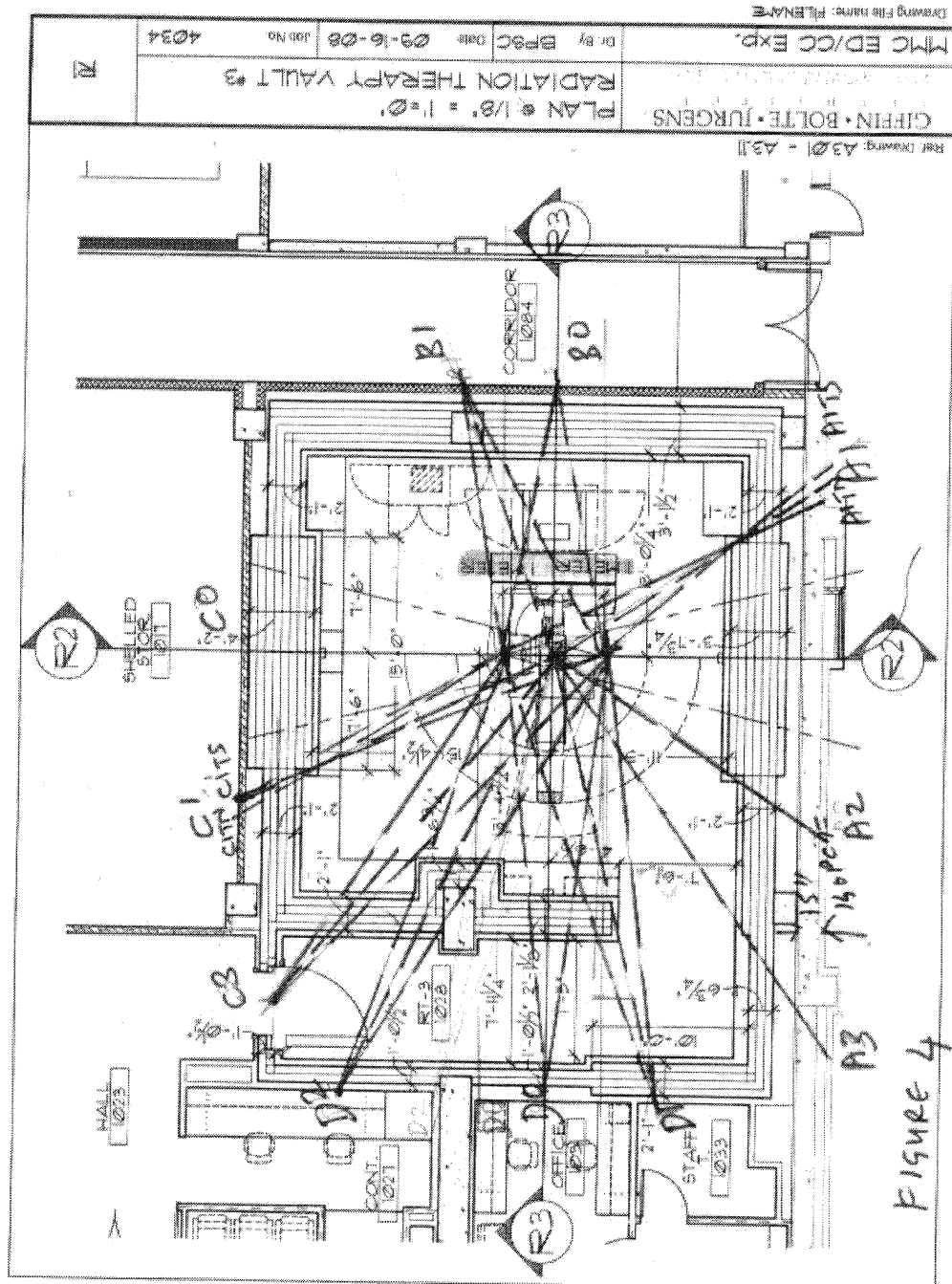


Figure 4: Floor Plan for Linac Vault and Locations at which Dose Equivalents are Calculated



**Figure 5: Section R2 for Linac Vault and Required Shielding**

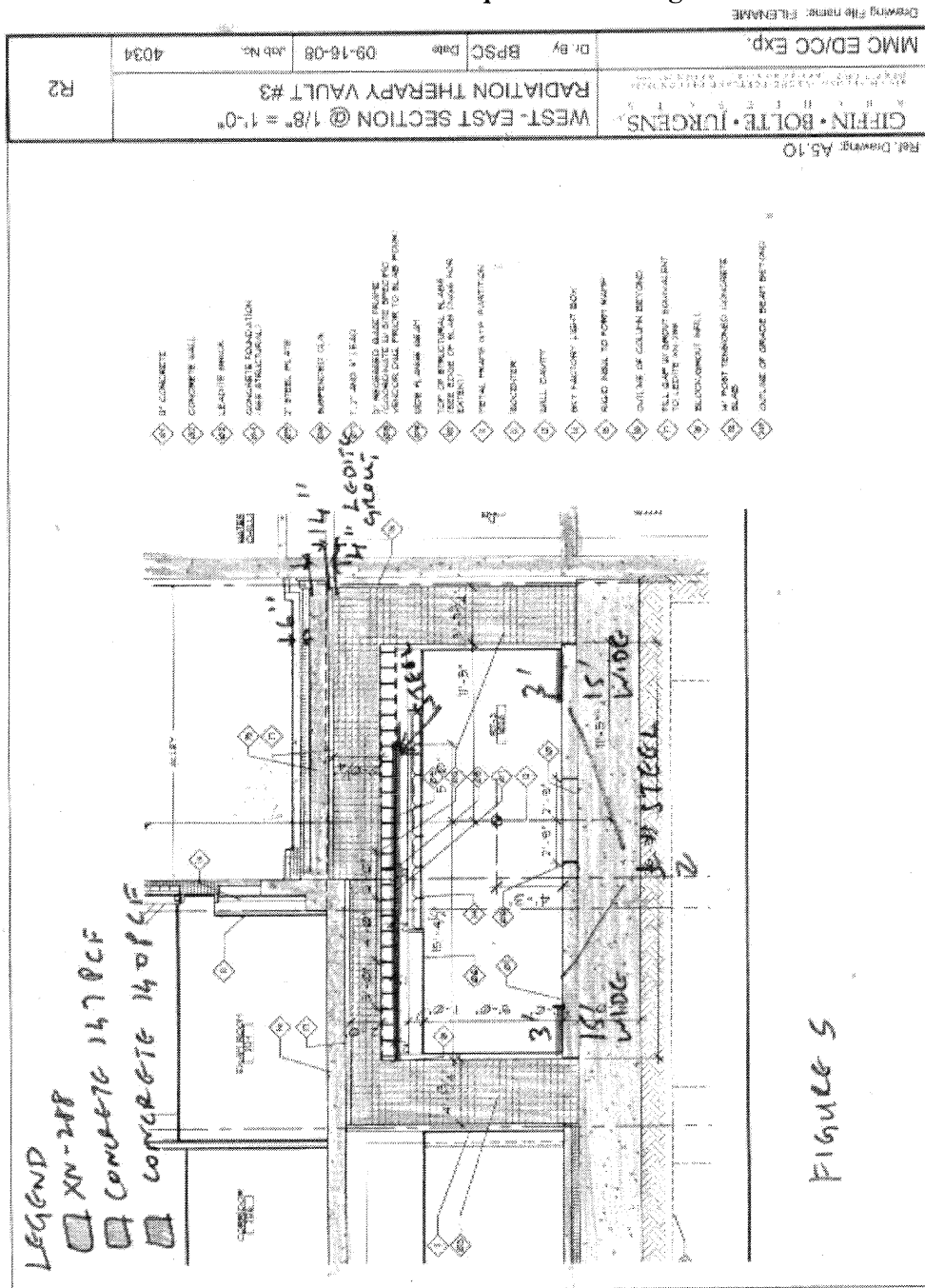


Figure 6: Floor Plan for Linac Vault and Locations at which Dose Equivalents are Calculated

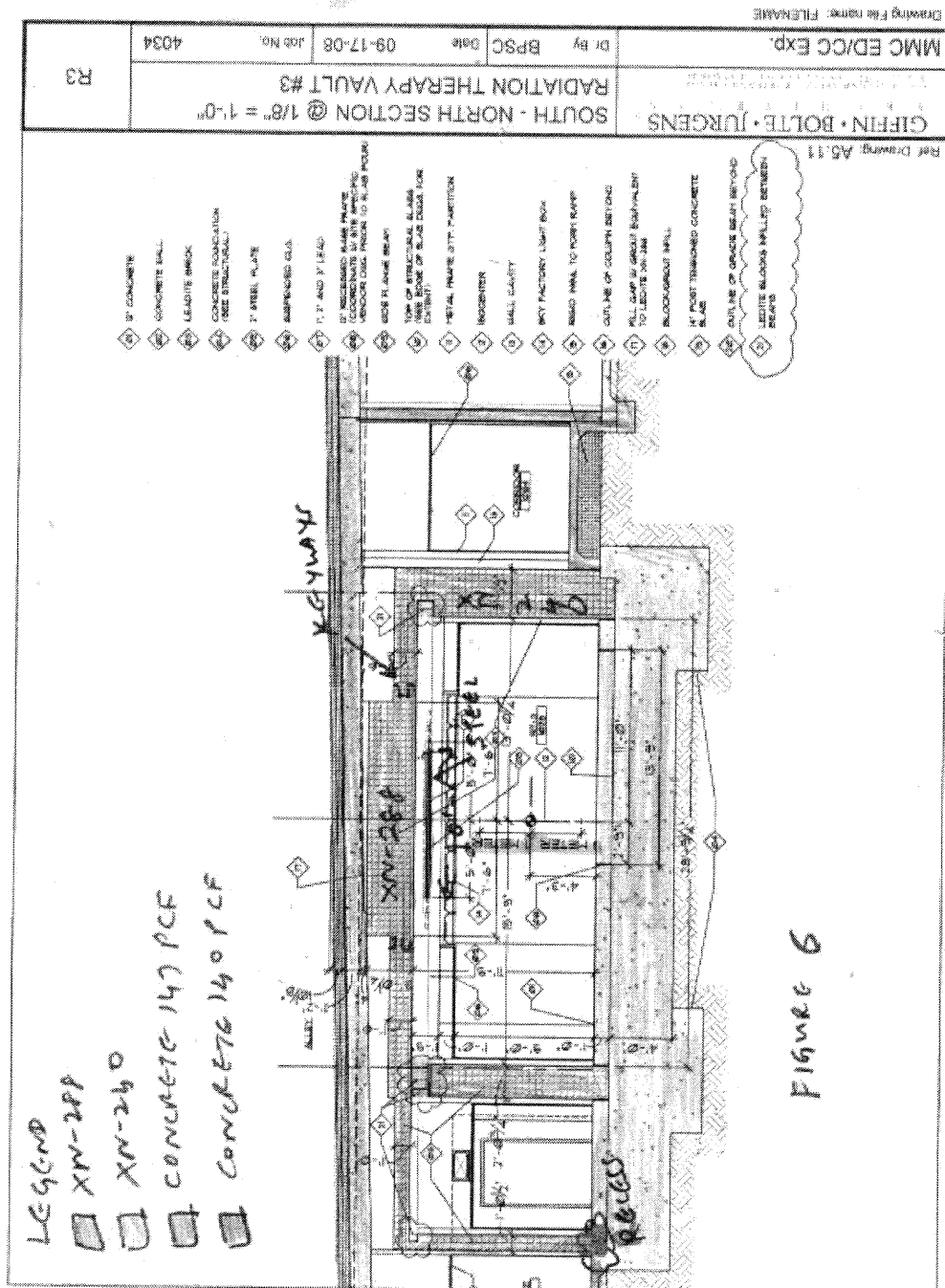
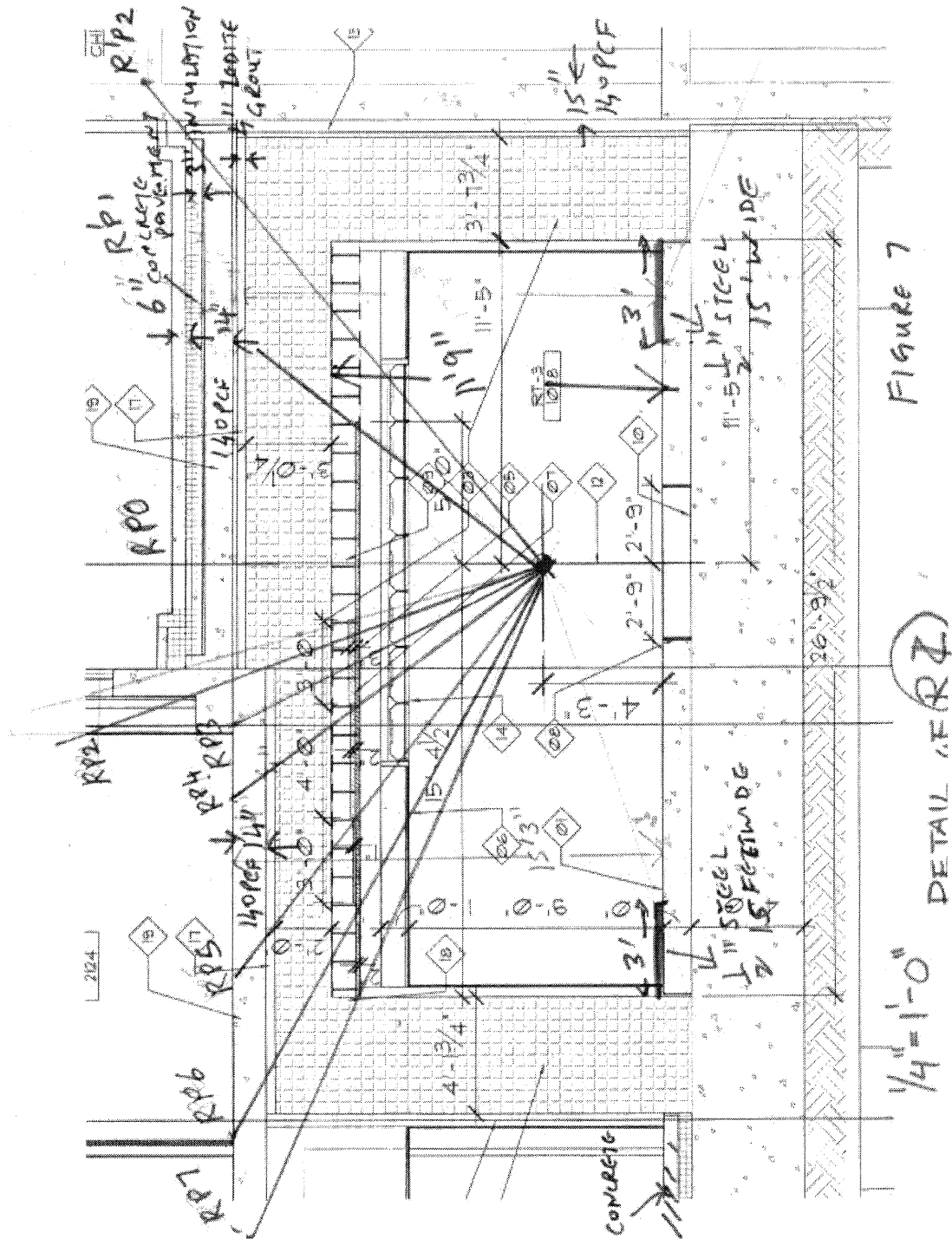


Figure 7: Section R2 for Linac Vault and Locations at which Dose Equivalents are Calculated



[illegible]

DETAIL OF R2

**Figure 9: Ceiling Plan and Required Shielding for Linac Vault (Ledite)**

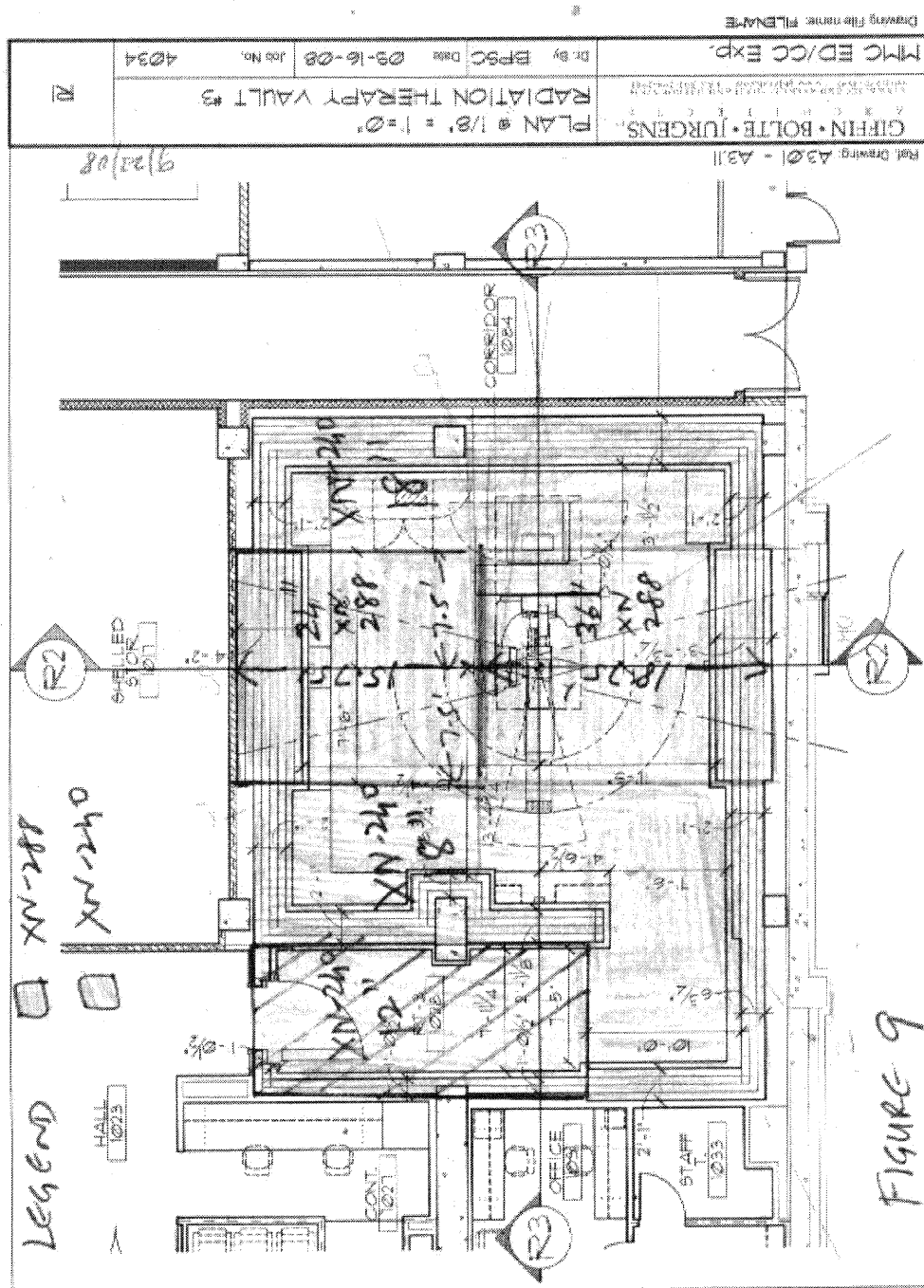
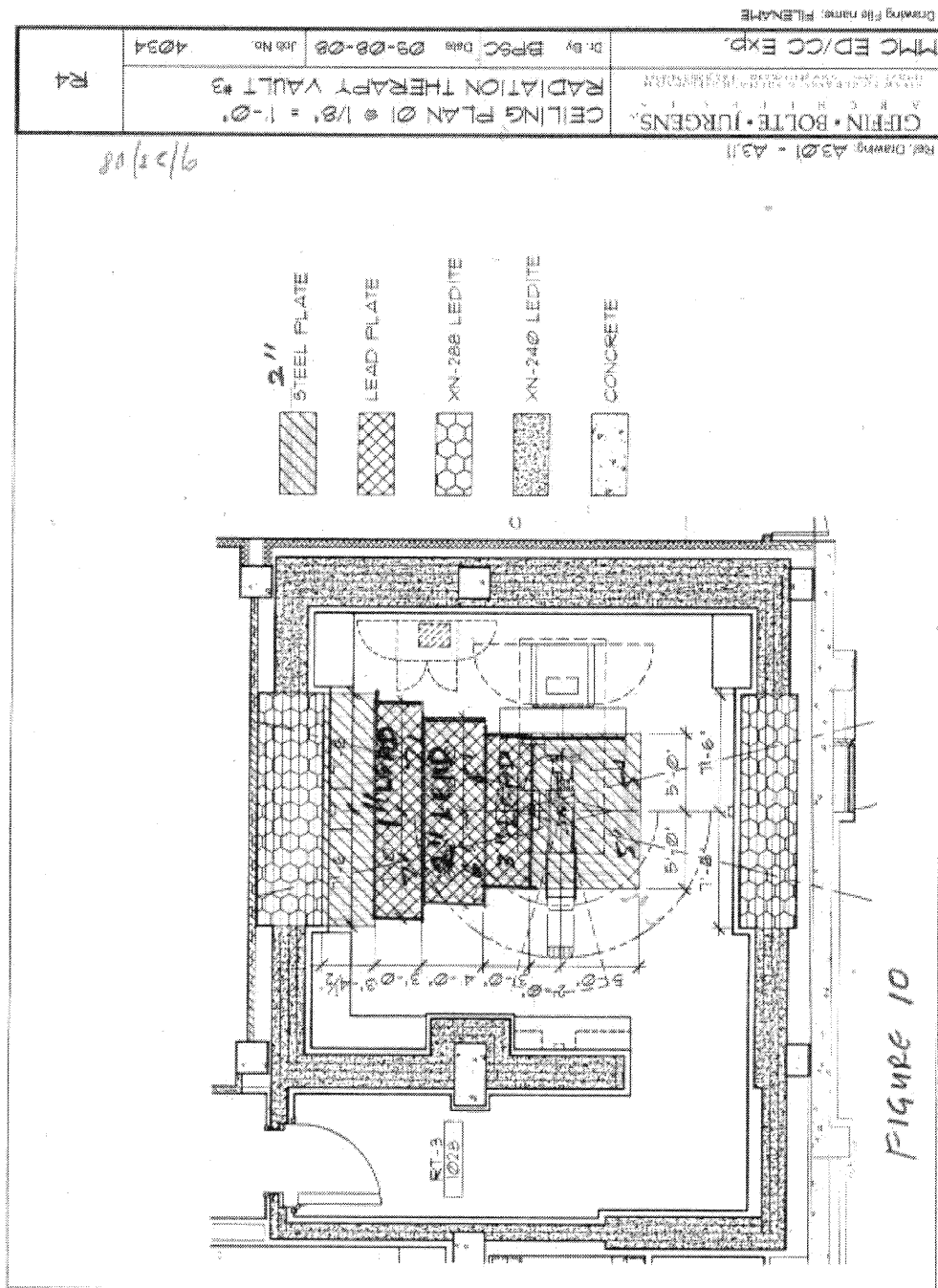




Figure 10: Ceiling Plan and Required Shielding for Linac Vault (Lead and Steel)



## 10.0 METHODS OF SHIELDING CALCULATION

### 10.1 General Methods

The methods outlined in NCRP Report No. 151 were used for primary and secondary barrier calculations.

#### 10.1.1 Primary Barrier

For the primary barrier the weekly photon dose,  $D_p$ , is given by:

$$D_{PRI} = W_{PRI}UT/d_p^2 \times (1/10^n)$$

Where

$W_{PRI}$  = Primary Weekly Workload (rads/week) at 1 m

U = Use Factor

T = Occupancy Factor

$d_p$  = distance from target to point of interest outside shielding

TVL = Tenth Value Layer of shielding for primary photons

t = shielding thickness

n = number of TVLs represented by the shielding =  $t/TVL$

#### 10.1.2 Secondary Barrier

To determine thickness of the secondary barriers, one must consider leakage photons, leakage neutrons and patient scattered photons (for energies below 10 MV).

##### 10.1.2.1 Photons

For the secondary barrier the weekly photon leakage dose  $D_s$  is given by:

$$D_L = W_LUT/d_s^2 \times (1/10^n)$$

Where

$W_L = W_s \times L$  = Secondary Weekly Workload

L = Photon Leakage

U = Use Factor = 1

T = Occupancy Factor

$d_s$  = distance from the isocenter to point of interest outside shielding (**the isocenter can be considered the average position**)

TVL = Tenth Value Layer of shielding for leakage photons

t = shield thickness

n = number of TVLs represented by the shielding =  $t/TVL$

For the secondary barrier the scattered patient dose  $D_p$  is given by:

$$D_p = aW_sUTF/(400 \times d_{sca}^2 \times d_s^2) \times (1/TVL^n)$$

Where a = scatter fraction

F = field area at phantom (scatterer) surface = 40 cm x 40 cm

U = Use Factor = 1

T = Occupancy Factor

$d_{sca}$  = distance from target to scatterer  $d_s$  = distance from the isocenter to outside of shielding

TVL = Tenth Value Layer of shielding for scattered X-rays  $t$  = shield thickness

$n$  = number of TVLs represented by the -shielding =  $t/\text{TVL}$

For photons 1 rad is equal to 1 rem (dose = dose equivalent)

Total Dose  $D_s = D_L + D_p$

### 10.1.2.2 Neutrons

For the secondary barrier the weekly neutron leakage dose  $D_n$  is given by:

$$D_n = W_{sn} UT/d_s^2 \times (1/10^n)$$

Where

$$W_{sn} = W_s P$$

$W_s$  = Secondary Weekly Workload

$P$  = neutron leakage = 2 mrem/rad at isocenter for 18 MV

U = Use Factor

T = Occupancy Factor

$d_s$  = distance from the isocenter to point of interest outside shielding

TVL = Tenth Value Layer of shielding for leakage neutrons

$t$  = shield thickness

$n$  = number of TVLs represented by the shielding =  $t/\text{TVL}$

### 10.1.3 Door

The dose equivalent at the door is comprised of leakage photons and neutrons reaching the door after traversing the maze wall, leakage neutrons scattered in the maze and primary scattered X-rays and leakage scattered x-rays.

#### 10.1.3.1 Scattered Leakage Neutrons

For mazes the modified Kersey method<sup>3</sup> can be used. This method calculates the total neutron dose equivalent rate (fast neutrons and thermal neutrons). The fast neutron and thermal neutron dose equivalent are nearly equal. The total neutron dose equivalent at the door,  $D_{tn}$ , is given by:

$$D_{tn} = D_t + D_n = WP/d^2 \times 10^{-1} \times 10^{-(L-3)/5}$$

Where

$D_t$  = thermal neutron dose equivalent (mrem/week)

$D_n$  = fast neutron dose equivalent rate (mrem/week)

$$D_t = D_n = D_{tn}/2$$

$W$  = photon dose rate at the isocenter (rad/week)

$P$  = neutron leakage (mrem/photon rad at the isocenter)

$D$  = distance from isocenter to mouth of maze

$L$  = total maze centerline distance

1<sup>st</sup> TVD = 3 m

2<sup>nd</sup> TVD = 5 m

where TVD = Tenth Value Distance

There is a third component  $D_\gamma$  consisting of neutron capture gamma rays, which is also almost equal to  $D_{tn}/2$

Thus the total dose equivalent is

$$D = D_t + D_n + D_\gamma$$

If the door is shielded with  $T_{bp}$ '' of borated polyethylene and T'' of metal, where the thickness of the borated polyethylene is sufficient to absorb all the thermal neutrons, the dose equivalent will be reduced as follows:

$$D = D_n A + D_\gamma 10^{-T/TVL_\gamma}$$

where A = attenuation factor of  $T_{bp}$ '' of borated polyethylene for fast neutrons

$TVL_\gamma$  = the tenth value of metal for capture gamma rays,

The TVL for thermal neutrons in borated polyethylene is 0.46''.

TVL for capture gamma rays is 2.41 inches

Two inches of borated polyethylene provides an attenuation of 0.18 for fast neutrons.

By placing a portion of the lead before the borated polyethylene, the borated polyethylene becomes more effective for the fast neutrons because the energy of the neutrons is degraded by inelastic collisions with the lead. A portion of the lead should be placed after the borated polyethylene to absorb the thermal neutron capture gamma rays generated in the boron.

## 10.2 Sample Calculation

A few sample calculations are shown below:

### 10.2.1 Primary Barrier – Future RT C0 (Plan View –Fig. 4)

$$D_{PRI} = W_{PRI} U T / d_p^2 \times (1/TVL^n)$$

$$W_{PRI} = 12,000 \text{ rads/week at 18 MV}$$

$$U = 0.16$$

$$T = 1$$

$$d_p = 7.11 \text{ m}$$

$$t_l = 48'' \text{ Ledite XN-288 (grout not included)}$$

$$TVL_1 = 9.70''$$

$$TVL_{2e} = 8.93''$$

$$n = n(\text{concrete}) = 1 + (48 - 9.70)/8.93 = 5.29$$

$$D_{PRI} = 12,000 \times 0.16 \times 1 / 7.11^2 \times 10^{-1} \times 10^{-4.29} = \mathbf{0.19 \text{ mrem/week}}$$

**Similarly dose at 6 MV = 0.015 mrem/week**

**Neutron dose is negligible**

**Total dose at C0 = 0.21 mrem/week**

$$T = 1/2$$

**Therefore  $D \times T = 0.10 \text{ mrem/week}$  which is well below the design limit of 2 mrem/week**

Integrated dose in 1 hour at isocenter = 600 rads.

Dose in any 1 hour at 18 MV,  $D_1 = 0.19 \text{ mrem/week} \times (600 \text{ rads}) / (12,000 \text{ rads/week}) =$

**0.0095 mrem in 1 h**

Instantaneous Dose Rate at 18 MV = 600 rads/min x 60 min/h x  $1/7.11^2 \times 10^{-1} \times 10^{-4.29} \times 1000$  mrem/h = **3.65 mrem/h**.

Differences from values in Table 6 are due to round off errors.

### 10.2.2 Secondary Barrier – C1 (Plan View –Fig. 4)

#### Leakage Photons

$$D_L = W_L U T / d_s^2 \times (1/\text{TVL}^n)$$

Where

$W_s = 12,000$  rads/week at 1 m

$W_L = 12,000 \times 0.001 \times 1000 = 12,000$  mrem/week

$U = 0.68$

$T = 1$

$d_L = 6.91$  m

TVL (leakage) for Ledite XN-240 = 9.19

$t = 24''$

$t_{\text{slant}} = 26.70''$

$n = 26.70/9.19 = 2.90$

Assume use factor of 68% from isocenter, 34% target up, 34% target down

C1:  $D_L = 12,000 \times 0.68 \times 1/6.91^2 \times 10^{-2.90} = \underline{\underline{0.21}}$  mrem/week at C1

C1TS: Target at south location

$t = 24''$

$t_{\text{slant}} = 25.87''$

$d_s = 5.62$  m

$n = 25.87/9.19 = 2.81$

$D_L = 12,000 \times 0.16 \times 1/5.62^2 \times 10^{-2.81} = \underline{\underline{0.09}}$

C1TN: Target at north location

$t = 24''$

$t_{\text{slant}} = 28.24''$

$d_s = 8.48$  m

$n = 28.24/9.19 = 3.07$

$D_L = 12,000 \times 0.16 \times 1/8.48^2 \times 10^{-3.07} = 0.02$

Conservatively assume all at same location A1

**Total  $D_L = 0.32$  mrem/week**

Integrated dose in 1 hour at isocenter = 600 rads.

Dose in any 1 hour at 18 MV,  $D_1 = 0.32$  mrem/week x (600 rads)/(12,000 rads/week) = 0.02 mrem in 1 h

Instantaneous Dose Rate at C1 at 18 MV = 600 rads/min x 0.001 x 60 min/h x  $1/6.91^2 \times 10^{-2.9} \times 1000$  mrem/h = 0.95 mrem/h.

Photons from patient scatter can be ignored at this location because the barrier is wide.

**Leakage Neutrons**

$$D_{Ln} = W_L UT/d_s^2 \times (1/TVL^n)$$

Where

$$W_L = 12000 \times 2 = 2,4000 \text{ mrem/week}$$

$$U = 1$$

$$T = 1$$

$$d_s = 6.91 \text{ m}$$

TVL (neutron leakage) for Ledite = 6.69"

$$t = 26.70''$$

$$n = 26.7/6.69 = 3.99$$

68% at isocenter

$$D_{Ln} = 24000 \times 0.68 \times 1/6.91^2 \times 10^{-3.99} = 0.035 \text{ mrem/week}$$

Similarly

CITN

$$D_{Ln} = 3.21E-03 \text{ mrem/week}$$

CITS

$$D_{Ln} = 1.66E-02 \text{ mrem/week}$$

**Total neutron dose = 0.055**

**Total Dose at C1 at 18 MV = 0.32 + 0.055 = 0.38 mrem/week**

**Total Dose at 6 MV = 0.11 mrem/week**

**Total Leakage Dose at C1 = 0.49 mrem/week**

Patient scattered dose is negligible as can be seen from Tables 8 and 9

**Photons from Patient – Scatter at A1 (Fig. 4)**

Determination of dose from patient-scatter ( $D_p$ ) is more complicated because the scattering angle changes as the gantry angle changes. For location A1, when the beam is pointed to Wall A, the scattering angle is 33.30 degrees, when the beam is pointed to Wall C, the scattering angle is  $180-33.30 = 146.7$  degrees, when the beam is pointed up or down the scattering angle is 90 degrees. For simplicity assume 33.30 degrees 0.16 of the time and 90 degrees 0.84 of the time. The value of  $a$  in each case is obtained from Table 4.

$$D_p = a W_s UTF / (400 \times d_{sca}^2 \times d_s^2) \times (1/10^n)$$

Assume  $A = 1600 \text{ cm}^2$

$$a = 2.16 \times 10^{-3} \text{ at } 33.30 \text{ degrees, } 18 \text{ MV (interpolated from Table 4)}$$

$$a = 1.89 \times 10^{-4} \text{ at } 90 \text{ degrees, } 18 \text{ MV}$$

$$T = 0.2$$

$$d_{sca} = 1 \text{ m}$$

$$d_s = 6.26 \text{ m}$$

t1= 21.54" (XN-240) from Table 6

t2= 17.09" (concrete) from Table 6

Assume XN240 TVL for 33.30 degrees = 7.72" at 18 MV

Assume concrete TVL for 33.30 degrees = 12.60"

Assume XN240 TVL for 90 degrees = 4.58" at 18 MV

Assume concrete TVL for 90 degrees = 7.48"

n1 (33.3 degrees) = 21.54/ 7.72 = 2.79

n2 (33.3 degrees) = 17.09/12.60 = 1.36

$$33.30 \text{ degrees: } D_{p1} = 2.16 \times 10^{-3} \times 0.2 \times 12,000 \times 1000 \times 0.16 \times 1 \times 1600 / (400 \times 6.26^2 \times 1^2) \times 10^{-4.15} = 6 \times 10^{-3} \text{ mrem/week at 18 MV}$$

n1 (90 degrees) = 21.54/ 4.58 = 4.70

n2 (90 degrees) = 17.09/7.48 = 2.28

$$90 \text{ degrees: } D_{p1} = 1.89 \times 10^{-4} \times 0.2 \times 12,000 \times 1000 \times 0.84 \times 1 \times 1600 / (400 \times 6.26^2 \times 1^2) \times 10^{-6.98} = 4 \times 10^{-6} \text{ mrem/week at 18 MV}$$

**Total patient scattered dose at 18 MV =  $6 \times 10^{-3}$  mrem/week**

Similarly at 6 MV, patient scattered dose =  $7.6 \times 10^{-4}$  mrem/week

**Total patient scattered dose =  $6.7 \times 10^{-3}$  mrem/week**

**Thus patient scattered dose is negligible.**

### 10.2.3 Door C3 (Fig. 4)

#### Neutron and Capture Gamma

Door shielding – 1 inch lead, 0.5 inch steel and 2 inches borated polyethylene

$$D_{tn} = D_t + D_n = WP/d^2 \times 10^{-1} \times 10^{-(L-3)/5}$$

Where

$$WP = 24000 \text{ mrem/week}$$

$$d = 6.86 \text{ m}$$

$$L = L1 = 7.01 \text{ m}$$

$$D_t + D_n = 24000 \text{ mrem/week} \times (6.86)^{-2} \times 10^{-3/3} \times 10^{-4.01/5} = 8.05 \text{ mrem/week}$$

$$D_t = D_n = 8.05/2 = 4.025 \text{ mrem/week}$$

$$D_\gamma = 4.02 \text{ mrem/week}$$

$$D = D_n A + D_t A_t + D_\gamma 10^{-T/TVL_\gamma}$$

$$T_{bp} = 2.0"$$

$$T_{pb} = 1$$

$$T_{steel} = 0.5$$

$$A = 0.18$$

$$A_t = 10^{-t/TVL_{tn}}$$

$$TVL_t = 0.46" \text{ of borated polyethylene}$$

$$TVL_\gamma = 2.4" \text{ (lead), } 5.31" \text{ (steel)}$$

$$D_{\gamma} = 4.025 \times 10^{-1/2.4} \times 10^{-0.5/5.31} = \underline{1.24 \text{ mrem/week}}$$

$$D_n = 4.025 \times 0.18 = \underline{0.72 \text{ mrem/week}}$$

$$D_t = 4.025 \times 10^{-2/0.46} = \underline{1.8 \times 10^{-4} \text{ mrem/week}}$$

$$\text{Total neutron and capture gamma} = 1.24 + 0.72 + 1.8 \times 10^{-4} \text{ mrem/week} = \underline{1.96 \text{ mrem/week}}$$

#### **Photon and neutron leakage at door**

Total leakage = 0.093 mrem/week at 18 MV w/o door

Total leakage = 0.02 mrem/week at 6 MV w/o door

**With door shielding total leakage can be ignored**

#### **Primary Beam Scatter**

In order to reach the door primary photons have to scatter two times. The average energy of the primary photons is about 5 MeV. The first scatter will reduce the energy to below 0.511 MeV. Since there is one more scatter, the energy of the photons at the door will be much less than 0.511 MeV. Since the TVL for 250 kV X-rays in lead is 0.134', and 0.75" in steel, respectively, the door with 1-inch lead and is equivalent to about 3.7 TVLs. Therefore this component can be neglected.

#### **Leakage Scatter**

In order to reach the door leakage photons have to scatter once. The average energy of the leakage photons is about 1.5 MeV. The first scatter will reduce the energy to below 0.511 MeV. Since the TVL for 511 kV X-rays in lead 0.55" and the door is shielded with 1.0 inch lead and 0.5 inch steel the scattered dose will be reduced by a factor of about 100. Thus this component can be ignored.

#### **Total**

Total dose equivalent at door = **2 mrem/week**

### **11.0 DOSE EVALUATION AND COMPLIANCE WITH REGULATORY DOSE LIMITS**

Table 6 shows the summary of the parameters used for the linac vaults, and the dose equivalent in various areas at 18 MV. Column 1 shows the location and the point of interest. Column 2 shows the area type (C= Controlled, NC= Non-Controlled). Column 3 shows the Occupancy Factor. Column 4 shows the Use Factor (U). Column 5 shows the distance to the point of interest from either the target ( $d_t$ ) for primary barriers, or the isocenter ( $d_s$ ) for secondary barriers. For secondary barriers the distance is usually measured from the isocenter. In some cases distances have been measured from the target (T) and are indicated by "U", "D" in Column 1, where U = Up, D= Down. Columns 6 and 7 show the unshielded weekly photon and neutron doses, respectively. Column 8 shows the unshielded photon dose rate. Columns 9, 10, 11 and 12 show the Ledite, concrete and steel slant thicknesses, traversed by the radiation to the point of interest, respectively. For the door, the lead shielding and polyethylene shielding have not been taken into account. Column 13 and 14 show the weekly photon and neutron dose equivalents, respectively. Dose equivalents below 0.01 mrem are



considered negligible and therefore shown as 0. Column 15 shows the total weekly dose equivalent. Column 16 shows the weekly dose equivalent times the Occupancy Factor. Column 17 shows the dose equivalent in 1 hour. Column 18 shows the instantaneous photon dose rate at the point of interest without the use of Occupancy or Use Factors.

Table 7 shows the summary of the parameters used for the linac vaults, and the dose equivalent in various areas at 6. MV. This table is similar to Table 6 except it does not include neutrons. Further the last two columns shows the total weekly. dose from 18 MV and 6 MV, and the weekly dose after application of Occupancy Factors. All dose equivalents are within regulatory limits after application of Use and Occupancy Factors.

Tables 8 and 9 show the patient scattered dose from 18 and 6 MV, respectively. Patient scattered doses are very negligible.

Table 6: Summary of Parameters and Dose Equivalent For Linac Vault at 18 MV

Location	Area	T	U	dt (m)	Unshielded Dose (mrem)	Neutron Dose (mrem)	Unshielded Dose Rate (mrem/h)	Ledite (")	Concrete e (")	Steel l (")	Lead (")	Photon Dose (mrem)	Neutron Dose (mrem)	Total Weekly Dose (mrem)	Dose x T (mrem)	Dose in 1 h (mrem)	Photon Dose Rate (mrem/h)
Corridor A0	P	0.2	0.16	6.77	41943.33	524.29	786437.46	42.00	14.29	0.00	0.00	0.180	5.18E-06	0.180	0.036	1.35E-02	3.37
Food office FutureRT	P	1	0.16	9.36	21931.34	274.14	411212.56	42.00	14.29	0.00	0.00	0.094	2.71E-06	0.094	0.094	7.05E-03	1.76
4 C0 Roof RP0-	P	0.5	0.16	7.11	37994.51	474.93	712397.07	48.00	0.00	0.00	0.00	0.196	3.17E-05	0.196	0.098	1.47E-02	3.67
Alley Roof R'P1-	P	0.125	0.34	6.07	110690.91	651.12	976684.47	36.00	13.33	2.00	0.00	0.835	6.61E-05	0.835	0.104	6.26E-02	7.61
Alley Roof R'P2-	P	0.125	0.34	7.28	76951.84	452.66	678986.84	45.42	16.82	2.52	0.00	0.025	6.80E-07	0.025	0.003	1.89E-03	0.23
Chiller Roof RP2-	P	0.125	0.34	7.67	69380.68	408.12	612182.46	50.91	17.35	0.00	0.00	0.021	7.99E-08	0.021	0.003	1.55E-03	0.18
Exam Roof RP3-	P	0.5	0.34	6.11	109336.14	643.15	964730.64	31.93	30.41	2.13	3.19	0.010	2.29E-06	0.010	0.005	7.87E-04	0.10
Exam Roof RP4-	P	0.5	0.34	4.76	179850.14	1057.94	1586913.00	26.94	14.96	2.24	3.37	0.318	1.54E-03	0.320	0.160	2.40E-02	2.91
Exam Roof RP5-	P	0.5	0.34	5.23	149161.48	877.42	1316130.68	30.28	16.82	2.52	2.52	0.182	2.42E-04	0.182	0.091	1.36E-02	1.67
Exam Roof RP6-	P	0.5	0.34	6.73	90174.64	530.44	795658.63	33.94	18.86	2.83	1.71	0.065	2.35E-05	0.065	0.033	4.89E-03	0.60
Exam Roof RP7-	P	0.5	0.34	8.04	63124.94	371.32	556984.79	33.94	18.86	2.83	0.00	0.263	1.65E-05	0.263	0.132	1.97E-02	2.43
Exam Corridor	P	0.5	0.34	9.61	44176.31	259.86	389790.98	52.11	18.86	0.00	0.00	0.008	2.21E-08	0.008	0.004	6.02E-04	0.07
Al Corridor	S	0.2	0.68	6.26	208.20	416.40	918.52	21.54	17.09	0.00	0.00	0.068	2.16E-03	0.071	0.014	5.29E-03	0.30
Al-TN Corridor	S	0.2	0.16	6.99	39.26	78.53	736.19	20.20	16.03	0.00	0.00	0.021	8.67E-04	0.022	0.004	1.66E-03	0.40
Al-TS	S	0.2	0.16	5.74	58.21	116.43	1091.53	24.42	19.38	0.00	0.00	0.007	1.18E-04	0.007	0.001	4.98E-04	0.12
		0.2										0.096	3.14E-03	0.099	0.020	7.445E-03	
Corridor A2	S	0.2	0.68	9.26	95.19	190.38	419.95	16.97	20.20	0.00	0.00	0.061	2.00E-03	0.063	0.013	4.72E-03	0.27
Corridor A2-TN	S	0.2	0.16	9.42	21.62	43.25	405.45	16.97	20.20	0.00	0.00	0.014	4.53E-04	0.014	0.003	1.07E-03	0.26
Corridor A2-TS	S	0.2	0.16	9.65	20.63	41.25	386.73	16.97	20.20	0.00	0.00	0.013	4.32E-04	0.014	0.003	1.02E-03	0.25
		0.2										0.088		0.091	0.018	6.810E-03	

Location	Area	T	U	dt (m)	Unshielded Dose (mrem)	Neutron Dose (mrem)	Unshielded Dose Rate (mrem/h)	Ledite (")	Concrete (")	Steel (")	Lead (")	Photon Dose (mrem)	Neutron Dose (mrem)	Total Weekly Dose (mrem)	Dose x T (mrem)	Dose in 1 h (mrem)	Dose Rate (mrem/h)
Corridor B0	S	0.2	0.68	5.19	303.18	606.36	1337.55	36.00	0.00	0.00	0.00	0.037	2.52E-03	0.039	0.008	2.93E-03	0.16
Corridor B0-TN	S	0.2	0.16	5.28	68.78	137.56	1289.64	36.66	0.00	0.00	0.00	0.007	4.55E-04	0.007	0.001	5.61E-04	0.13
Corridor B0-TS	S	0.2	0.16	5.28	68.78	137.56	1289.64	36.66	0.00	0.00	0.00	0.007	4.55E-04	0.007	0.001	5.61E-04	0.13
Corridor B1	S	0.2	0.68	5.53	266.46	532.92	1175.55	12.69	25.38	0.00	0.00	0.225	5.76E-03	0.231	0.046	5.179E-03	0.99
Corridor B1-TN	S	0.2	0.16	5.35	67.10	134.20	1258.08	12.27	24.54	0.00	0.00	0.072	2.12E-03	0.074	0.015	9.796E-03	1.34
Corridor B1-TS	S	0.2	0.16	5.87	55.68	111.35	1043.91	26.94	6.73	0.00	0.00	0.023	1.61E-03	0.025	0.005	1.903E-02	0.43
Future RT4 C1	S	0.5	0.68	6.91	170.91	341.81	754.00	26.70	0.00	0.00	0.00	0.212	3.49E-02	0.247	0.123	1.85E-02	0.94
Future RT4 C1-TN	S	0.5	0.16	8.48	26.67	53.35	500.13	28.24	0.00	0.00	0.00	0.023	3.21E-03	0.026	0.013	1.93E-03	0.42
Future RT4 C1-TS	S	0.5	0.16	5.62	60.89	121.77	1141.60	25.87	0.00	0.00	0.00	0.093	1.66E-02	0.110	0.055	8.23E-03	1.75
Door C3	S	0.2	0.68	8.60	110.28	220.56	486.53	30.46	0.00	0.00	0.00	0.053	6.18E-03	0.060	0.012	4.47E-03	0.24
Door C3-TN	S	0.2	0.16	9.23	22.53	45.06	422.43	32.82	0.00	0.00	0.00	0.006	5.60E-04	0.007	0.001	4.95E-04	0.11
Door C3-TS	S	0.2	0.16	7.89	30.86	61.72	578.64	28.62	0.00	0.00	0.00	0.024	3.26E-03	0.027	0.005	2.02E-03	0.44
Office D0	S	1	0.68	8.69	108.14	216.27	477.07	30.00	0.00	0.00	0.00	0.083	0.010	0.093	0.019	6.985E-03	0.26
Office D0-TN	S	1	0.16	8.43	27.00	54.00	506.24	30.20	0.00	0.00	0.00	0.014	1.65E-03	0.016	0.016	1.17E-03	0.26
Office D0-TS	S	1	0.16	8.38	27.33	54.66	512.40	30.20	0.00	0.00	0.00	0.014	1.67E-03	0.016	0.016	1.18E-03	0.26
		1										0.087	0.010	0.097	0.097	7.289E-03	

Location	Area	T	U	dt (m)	Unshielded Dose (mrem)	Neutron Dose (mrem)	Unshielded Dose Rate (mrem/h)	Ledite (°)	Concrete (°)	Steel (°)	Lead (°)	Photon Dose (mrem)	Neutron Dose (mrem)	Total Weekly Dose (mrem)	Dose x T (mrem)	Dose in 1 h (mrem)	Dose Rate (mrem/h)
Toilet D1	S	0.2	0.68	8.93	102.24	204.49	451.07	24.68	0.00	0.00	0.00	0.210	4.18E-02	0.252	0.050	1.89E-02	0.93
Toilet D1-TN	S	0.2	0.16	9.19	22.75	45.49	426.50	50.77	0.00	0.00	0.00	0.000	1.17E-06	0.000	0.000	5.17E-06	0.00
Toilet D1-TS	S	0.2	0.16	8.75	25.07	50.13	469.99	24.18	0.00	0.00	0.00	0.059	1.22E-02	0.071	0.014	5.30E-03	1.10
		0.2										<u>0.269</u>	<u>0.054</u>	<u>0.323</u>	<u>0.065</u>	<u>2.423E-02</u>	
Control D2-Control D2-TN	S	1	1	9.58	130.62	<b>261.24</b>	391.86	39.72	0.00	0.00	0.00	<b>0.006</b>	<b>3.02E-04</b>	<b>0.007</b>	<b>0.007</b>	4.88E-04	<b>0.02</b>
Control D2-TS	S	1	1	9.19	142.17	<b>284.34</b>	426.50	38.07	0.00	0.00	0.00	<b>0.010</b>	<b>5.79E-04</b>	<b>0.011</b>	<b>0.011</b>	8.09E-04	<b>0.03</b>
	S	1	1	10.03	119.27	<b>238.54</b>	357.80	34.64	27.71	0.00	0.00	<b>0.000</b>	<b>7.06E-07</b>	<b>0.000</b>	<b>0.000</b>	2.16E-05	<b>0.00</b>
		1										<u><b>0.017</b></u>	<u><b>8.81E-04</b></u>	<u><b>0.018</b></u>	<u><b>0.018</b></u>	<u><b>1.318E-03</b></u>	
Alley R1-Alley R1-TU	S	0.125	0.32	5.06	150.06	300.11	1406.78	23.43	17.36	0.00	0.00	0.029	7.52E-04	0.030	0.004	2.26E-03	0.28
Alley R1-TD	S	0.125	0.34	4.76	180.09	360.17	1589.01	25.46	18.86	0.00	0.00	0.017	2.96E-04	0.017	0.002	1.29E-03	0.15
	S	0.125	0.34	5.73	124.47	248.94	1098.25	21.09	15.62	0.00	0.00	0.057	2.26E-03	0.060	0.007	4.46E-03	0.51
		0.125										<u>0.104</u>	<u>3.31E-03</u>	<u>0.107</u>	<u>0.013</u>	<u>8.018E-03</u>	
Alley R2-Alley R2-TU	S	0.125	0.32	8.67	51.09	102.18	478.95	16.97	18.86	0.00	0.00	0.040	1.56E-03	0.042	0.005	3.13E-03	0.38
Alley R2-TD	S	0.125	0.34	8.58	55.41	110.81	488.88	16.97	18.86	0.00	0.00	0.044	1.69E-03	0.045	0.006	3.40E-03	0.38
	S	0.125	0.34	9.72	43.16	86.33	380.85	16.97	18.86	0.00	0.00	0.034	1.32E-03	0.035	0.004	2.65E-03	0.30
		0.125										<u>0.118</u>	<u>4.56E-03</u>	<u>0.122</u>	<u>0.015</u>	<u>9.172E-03</u>	

Table 7: Summary of Parameters and Dose Equivalent For Linac Vault at 6 MV

Location	Area	T	U	dt (m)	Unshielded Dose Rate (mrem/h)	Ledite (°)	Concrete (°)	Steel l (")	Lead d (")	Photon Dose (mrem)	Dose x T (mrem)	Dose in l h (mrem)	Photon Dose Rate (mrem/h)	Total Dose 6 & 18 (mrem)	Weekly Dose x T (mrem)
Corridor A0	P	0.2	0.16	6.77	83886.66	42.00	14.29	0.00	0.00	0.011	0.002	3.98E-04	0.099	0.1	0.04
Food office Future RT4	P	1	0.16	9.36	43862.67	42.00	14.29	0.00	0.00	0.006	0.006	2.08E-04	0.052	0.10	0.10
C0	P	0.5	0.16	7.11	75989.02	48.00	0.00	0.00	0.00	0.015	0.007	5.46E-04	0.137	0.21	0.11
Roof RP0- Alley	P	0.125	0.34	6.07	221381.81	36.00	13.33	2.00	0.00	0.076	0.009	2.84E-03	0.310	0.91	0.11
Roof R P1- Alley	P	0.125	0.34	7.28	153903.68	45.42	16.82	2.52	0.00	0.001	0.000	4.01E-05	0.004	0.03	0.00
Roof R P2- Chiller	P	0.125	0.34	7.67	138761.36	50.91	17.35	0.00	0.00	0.001	0.000	2.25E-05	0.003	0.02	0.00
Roof RP2- Exam	P	0.5	0.34	6.11	218672.28	31.93	30.41	2.13	3.19	0.001	0.000	2.21E-05	0.002	0.01	0.01
Roof RP3- Exam	P	0.5	0.34	4.76	359700.28	26.94	14.96	2.24	3.37	0.048	0.024	1.81E-03	0.196	0.37	0.18
Roof RP4- Exam	P	0.5	0.34	5.23	298322.95	30.28	16.82	2.52	2.52	0.020	0.010	7.67E-04	0.082	0.20	0.10
Roof RP5- Exam	P	0.5	0.34	6.73	180349.29	33.94	18.86	2.83	1.71	0.005	0.003	1.99E-04	0.021	0.07	0.04
Roof RP6- Exam	P	0.5	0.34	8.04	126249.89	33.94	18.86	2.83	0.00	0.021	0.011	8.04E-04	0.085	0.28	0.14
Roof RP7- Exam	P	0.5	0.34	9.61	88352.62	52.11	18.86	0.00	0.00	0.000	0.000	7.60E-06	0.001	0.01	0.00
Corridor A1	S	0.2	0.68	6.26	791.15	21.54	17.09	0.00	0.00	0.014	0.003	1.11E-03	0.016	0.08	0.02
Corridor A1- TN	S	0.2	0.16	6.99	149.20	20.20	16.03	0.00	0.00	0.005	0.001	4.13E-04	0.026	0.03	0.01
Corridor A1- TS	S	0.2	0.16	5.74	221.22	24.42	19.38	0.00	0.00	0.001	0.000	7.16E-05	0.004	0.01	0.00
		0.2								0.020	0.004	1.595E-03		0.12	0.02
Corridor A2	S	0.2	0.68	9.26	361.71	16.97	20.20	0.00	0.00	0.016	0.003	1.26E-03	0.019	0.08	0.02
Corridor A2- TN	S	0.2	0.16	9.42	82.17	16.97	20.20	0.00	0.00	0.004	0.001	2.86E-04	0.018	0.02	0.00
Corridor A2- TS	S	0.2	0.16	9.65	78.38	16.97	20.20	0.00	0.00	0.003	0.001	2.73E-04	0.017	0.02	0.00
		0.2								0.023	0.005	1.819E-03		0.11	0.02

Location	Area	T	U	dt (m)	Unshielded Dose (mrem)	Unshielded Dose Rate (mrem/h)	Ledite (")	Concrete (")	Steel (")	Lead (")	Photon Dose (mrem)	Dose x T (mrem)	Dose in 1 h (mrem)	Dose Rate (mrem/h)	Total Dose 6 & 18 MV (mrem)	Weekly Dose x T (mrem)
Corridor B0	S	0.2	0.68	5.19	1152.08	1337.55	36.00	0.00	0.00	0.00	0.005	0.001	4.13E-04	0.006	0.04	0.01
Corridor B0-TN	S	0.2	0.16	5.28	261.37	1289.64	36.66	0.00	0.00	0.00	0.001	0.000	7.46E-05	0.005	0.01	0.00
Corridor B0-TS	S	0.2	0.16	5.28	261.37	1289.64	36.66	0.00	0.00	0.00	0.001	0.000	7.46E-05	0.005	0.01	0.00
		0.2									<u>0.007</u>	<u>0.001</u>	<u>5.620E-04</u>		<u>0.06</u>	<u>0.01</u>
Corridor B1	S	0.2	0.68	5.53	1012.54	1175.55	12.69	25.38	0.00	0.00	0.065	0.013	5.15E-03	0.076	0.30	0.06
Corridor B1-TN	S	0.2	0.16	5.35	254.97	1258.08	12.27	24.54	0.00	0.00	0.023	0.005	1.79E-03	0.112	0.10	0.02
Corridor B1-TS	S	0.2	0.16	5.87	211.57	1043.91	26.94	6.73	0.00	0.00	0.005	0.001	4.10E-04	0.026	0.03	0.01
		0.2									<u>0.093</u>	<u>0.019</u>	<u>7.345E-03</u>		<u>0.42</u>	<u>0.08</u>
Future RT4 C1	S	0.5	0.68	6.91	649.45	754.00	26.70	0.00	0.00	0.00	0.071	0.035	5.58E-03	0.082	0.32	0.16
Future RT4 C1-TN	S	0.5	0.16	8.48	101.36	500.13	28.24	0.00	0.00	0.00	0.007	0.003	5.15E-04	0.032	0.03	0.02
Future RT4 C1-TS	S	0.5	0.16	5.62	231.36	1141.60	25.87	0.00	0.00	0.00	0.034	0.017	2.64E-03	0.165	0.14	0.07
		0.5									<u>0.111</u>	<u>0.055</u>	<u>8.738E-03</u>		<u>0.49</u>	<u>0.25</u>
Door C3	S	0.2	0.68	8.60	419.06	486.53	30.46	0.00	0.00	0.00	0.013	0.003	9.98E-04	0.015	0.07	0.01
Door C3-TN	S	0.2	0.16	9.23	85.61	422.43	32.82	0.00	0.00	0.00	0.001	0.000	9.10E-05	0.006	0.01	0.00
Door C3-TS	S	0.2	0.16	7.89	117.27	578.64	28.62	0.00	0.00	0.00	0.007	0.001	5.24E-04	0.033	0.03	0.01
		0.2									<u>0.020</u>	<u>0.004</u>	<u>1.613E-03</u>		<u>0.11</u>	<u>0.02</u>
Office D0	S	1	0.68	8.69	410.92	477.07	30.00	0.00	0.00	0.00	0.014	0.014	1.14E-03	0.017	0.08	0.08
Office D0-TN	S	1	0.16	8.43	102.60	506.24	30.20	0.00	0.00	0.00	0.003	0.003	2.67E-04	0.017	0.02	0.02
Office D0-TS	S	1	0.16	8.38	103.85	512.40	30.20	0.00	0.00	0.00	0.003	0.003	2.70E-04	0.017	0.02	0.02
		1									<u>0.021</u>	<u>0.021</u>	<u>1.681E-03</u>		<u>0.12</u>	<u>0.12</u>

Location	Area	T	U	dt (m)	Unshielded Dose (mrem)	Unshielded Dose Rate (mrem/h)	Ledlite (")	Concrete (")	Steel (")	Lead (")	Photon Dose (mrem)	Dose x T (mrem)	Dose in 1 h (mrem)	Dose Rate (mrem/h)	Total Dose 6 & 18 MV (mrem)	Weekly Dose x T (mrem)
Toilet D1	S	0.2	0.68	8.93	204.49	451.07	24.68	0.00	0.00	0.00	0.084	0.017	6.66E-03	0.098	0.08	0.07
Toilet D1-TN	S	0.2	0.16	9.19	45.49	426.50	50.77	0.00	0.00	0.00	0.000	0.000	1.99E-07	0.000	0.02	0.00
Toilet D1-TS	S	0.2	0.16	8.75	50.13	469.99	24.18	0.00	0.00	0.00	0.025	0.005	1.94E-03	0.121	0.02	0.02
		0.2									<u>0.109</u>	<u>0.022</u>	<u>8.597E-03</u>		<u>0.12</u>	0.09
Control D2	S	1	1	9.58	496.36	391.86	39.72	0.00	0.00	0.00	0.001	0.001	4.98E-05	0.000	0.01	0.01
Control D2-TN	S	1	1	9.19	540.24	426.50	38.07	0.00	0.00	0.00	0.001	0.001	9.52E-05	0.001	0.01	0.01
Control D2-TS	S	1	1	10.03	453.22	357.80	34.64	27.71	0.00	0.00	0.000	0.000	7.81E-07	0.000	0.00	0.00
		1									<u>0.002</u>	<u>0.002</u>	<u>1.459E-04</u>		<u>0.02</u>	0.02
Alley R1	S	0.125	0.32	5.06	300.11	1406.78	23.43	17.36	0.00	0.00	0.005	0.001	3.96E-04	0.012	1.52	0.00
Alley R1-TU	S	0.125	0.34	4.76	360.17	1589.01	25.46	18.86	0.00	0.00	0.002	0.000	1.74E-04	0.005	0.09	0.00
Alley R1-TD	S	0.125	0.34	5.73	248.94	1098.25	21.09	15.62	0.00	0.00	0.013	0.002	1.05E-03	0.031	0.02	0.01
		0.125									<u>0.021</u>	<u>0.003</u>	<u>1.621E-03</u>		<u>1.63</u>	0.02
Alley R2	S	0.125	0.32	8.67	102.18	478.95	16.97	18.86	0.00	0.00	0.011	0.001	8.96E-04	0.028	0.04	0.01
Alley R2-TU	S	0.125	0.34	8.58	110.81	488.88	16.97	18.86	0.00	0.00	0.012	0.002	9.72E-04	0.029	0.02	0.01
Alley R2-TD	S	0.125	0.34	9.72	86.33	380.85	16.97	18.86	0.00	0.00	0.010	0.001	7.57E-04	0.022	0.07	0.01
		0.125									<u>0.033</u>	<u>0.004</u>	<u>2.625E-03</u>		<u>0.13</u>	0.02





**TABLE 8: Patient Scatter For 18 MV**

Location	Scatter Angle (°)	a	W (rads/week)	U	T	F (cm2)	d <sub>sca</sub> (m)	d <sub>sec</sub> (m)	Unshielded Dose (mrem/wk)	Dose (mrem/week)	Total Dose (mrem/week)	DxT
A1	33.30	2.16E-03	12000	0.16	0.2	1600	1	6.26	423.94	3.02E-02	1.21E-03	
A1	90.00	1.89E-04	12000	0.84	0.2	1600	1	6.26	194.43	2.01E-05	8.04E-07	
C1	26.00	3.67E-03	12000	0.16	0.5	1600	1	6.91	590.98	2.05E-01	5.12E-02	
C1	90.00	1.89E-04	12000	0.84	0.5	1600	1	6.91	159.61	2.37E-04	5.93E-05	
R1	39.81	1.44E-03	12000	0.34	0.125	1600	1	5.06	918.62	3.54E-02	5.53E-04	
R1	90.00	1.89E-04	12000	0.66	0.125	1600	1	5.06	233.97	8.61E-06	1.35E-07	

**TABLE 9: Patient Scatter For 6 MV**

Location	Scatter Angle (°)	a	W (rads/week)	U	T	F (cm2)	d <sub>sca</sub> (m)	d <sub>sec</sub> (m)	Unshielded Dose (mrem/wk)	Dose (mrem/week)	Total Dose (mrem/week)	DxT
A1	33.30	2.47E-03	12000	0.16	0.2	1600	1	6.26	483.30	3.80E-03	1.52E-04	
A1	90.00	4.26E-04	12000	0.84	0.2	1600	1	6.26	438.25	6.83E-06	2.73E-07	
C1	26.00	4.35E-03	12000	0.16	0.5	1600	1	6.91	700.36	700.36	9.64E-03	
C1	90.00	4.26E-04	12000	0.84	0.5	1600	1	6.91	359.75	359.75	1.34E-04	
R1	39.81	1.87E-03	12000	0.34	0.125	1600	1	5.06	1190.96	4.40E-03	6.87E-05	
R1	90.00	4.26E-04	12000	0.66	0.125	1600	1	5.06	527.37	1.94E-05	3.03E-07	

## 12. CONCLUSIONS

All rooms are designed for a specific application and for a specific location of the equipment and control functions (Figures 1-9). Any change in these applications, location of equipment, traffic patterns in the room, or location of control functions must be reviewed for possible changes in shielding requirements. Changes in occupancy or utilization of areas adjacent to the linac vault may also change shielding requirements and shall be reviewed.

The calculations in this report demonstrates compliance with the regulatory limits. Radiation surveys will be performed after installation to ensure the adequacy and integrity of the shielding and compliance with regulatory limits. It is also recommended that passive area monitoring be performed in the vicinity of the facility to ensure compliance with regulatory limits.

Respectfully submitted

A handwritten signature in dark ink, reading "Nisy E. Ipe". The signature is written in a cursive, flowing style. The first name "Nisy" is followed by a period and the last name "Ipe".

Nisy E. Ipe, Ph.D., C.H.P.

## OUTLINE SPECIFICATION

### SECTION 14 21 00 TRACTION ELEVATORS

#### PART 1 GENERAL

##### 1.1 QUALITY ASSURANCE

All work shall be performed in accordance with the latest edition of the "American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks" (ASME A17.1), including published supplements; "National Electrical Code," "OSHA," "NFPA," "IBC," "A.D.A. Handicapped Code, and such state and local codes as may be applicable.

#### PART 2 PRODUCTS

##### 2.1 APPROVED PROVIDERS:

- A. Non-proprietary Controllers by MCE, Elevator Controls Corporation or Swift.
- B. Gearless and Geared Elevators: KONE, Otis, Schindler, ThyssenKrupp and Fujitec.
- C. Car Enclosure: Eklund's Inc., Gunderlin, Ltd., Hauenstein & Burmeister, KONE, Otis, Schindler, ThyssenKrupp, Tyler, Fujitec, Mitsubishi.
- D. Hoistway Entrance: Hauenstein & Burmeister, KONE, Otis, Schindler, ThyssenKrupp, Tyler, Fujitec, Mitsubishi.

##### 2.2 SUMMARY – TRACTION ELEVATOR EQUIPMENT

###### A. North Core Patient Elevators:

NUMBER:	CARS 19-20
CAPACITY:	9000 #
CLASS LOADING:	SERVICE CLASS A
CONTRACT SPEED:	350 FPM
ROPING:	1:1 OR 2:1
MACHINE:	GEARED OR GEARLESS AS REQUIRED TO MEET CAPACITY AND SPEED
MACHINE LOCATION:	OVERHEAD
OPERATIONAL CONTROL:	DUPLEX SELECTIVE COLLECTIVE MICROPROCESSOR BASED SYSTEM
MOTOR CONTROL:	AC VARIABLE VOLTAGE VARIABLE FREQUENCY MICROPROCESSOR BASED WITH DIGITAL CLOSED-LOOP FEEDBACK

POWER CHARACTERISTICS:	480 VOLTS, 3 PHASE, 60 HERTZ
STOPS:	7 FRONT 1 REAR
OPENINGS:	7 FRONT 1 REAR
FLOORS SERVED:	1-2, 4-8 FRONT 3 REAR
TRAVEL:	95'-8" ±
PLATFORM SIZE:	8'-0" WIDE X 11'-6" DEEP
MINIMUM CLEAR INSIDE CAR:	7'-8" WIDE X 10'-7" DEEP
ENTRANCE SIZE:	5'-0" WIDE X 7'-0" HIGH
ENTRANCE TYPE:	TWO SPEED, CENTER OPENING
DOOR OPERATION:	HIGH SPEED, HEAVY-DUTY, DOOR OPERATOR, MINIMUM OPENING SPEED 2-1/2 F.P.S.
DOOR PROTECTION:	3-DIMENSIONAL INFRARED, FULL SCREEN DEVICE, WITH DIFFERENTIAL TIMING NUDGING AND INTERRUPTED BEAM TIME
SAFETY:	FLEXIBLE GUIDE CLAMP-TYPE B, CAR
GUIDE RAILS:	PLANED STEEL TEES
BUFFERS:	OIL
COMPENSATION:	PROVIDER'S STANDARD APPLICATION AS REQUIRED
CAR ENCLOSURE:	SUBMIT BROCHURES DEPICTING MANUFACTURERS' FULL RANGE FOR SELECTION  8'-0" CLEAR HEIGHT UNDER CANOPY
SIGNAL FIXTURES:	LED ILLUMINATION PROVIDER'S STANDARD VANDAL RESISTANT ASSEMBLY
HALL AND CAR PUSHBUTTON STATIONS:	DUAL HALL PUSHBUTTON RISERS  'CODE BLUE' SERVICE OPERATION RISER  DUAL CAR OPERATING PANELS  VANDAL RESISTANT CAR AND HALL PUSHBUTTONS
CAR POSITION INDICATORS:	SINGLE DIGITAL WITH CAR DIRECTION ARROWS

	SECURITY CONTROL PANEL
	FIREFIGHTERS' CONTROL PANEL
HALL LANTERNS:	AT ALL FLOORS WITH VOLUME ADJUSTABLE ELECTRONIC CHIME OR TONE. SOUND TWICE FOR DOWN DIRECTION
COMMUNICATION SYSTEM:	SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL, TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING AND VOICELESS COMMUNICATION
FIXTURE SUBMITTAL:	SUBMIT BROCHURE DEPICTING MANUFACTURER'S FULL RANGE OF FIXTURES FOR SELECTION
ADDITIONAL FEATURES – (CARS 19-20 ):	CAR AND COUNTERWEIGHT ROLLER GUIDES  CAR TOP INSPECTION STATION  FIREFIGHTERS' SERVICE, PHASE I AND II, INCLUDING ALTERNATE FLOOR RETURN  STANDBY POWER TRANSFER (AUTOMATIC TO MAIN FLOOR) WITH MANUAL OVERRIDE IN FIREFIGHTERS' CONTROL PANEL  ACCESSIBILITY AND EMERGENCY MEDICAL SERVICES SIGNAGE  RECESSED SIDE WALL PANELS ARRANGED FOR RECESSED APPLIED CAR OPERATING PANELS  HOISTWAY ACCESS SWITCHES TOP AND BOTTOM FLOORS  HOISTWAY DOOR UNLOCKING DEVICE ALL FLOORS  PLATFORM ISOLATION  LOAD-WEIGHING DEVICE  ANTI-NUISANCE FEATURE  INDEPENDENT SERVICE FEATURE  HOSPITAL EMERGENCY 'CODE BLUE' PRIORITY SERVICE  SELECTIVE DOOR OPERATION  CARD READER PROVISIONS  CCTV PROVISIONS

SECURITY CONTROL PANEL AND REMOTE  
WIRING

FIREFIGHTERS' CONTROL PANEL AND REMOTE  
WIRING

MACHINE, POWER CONVERSION UNIT, AND  
CONTROLLER SOUND ISOLATION

TAMPER RESISTANT FASTENERS FOR ALL  
FASTENINGS EXPOSED TO THE PUBLIC

ONE YEAR WARRANTY MAINTENANCE WITH 24-  
HOUR CALL-BACK SERVICE

SILL SUPPORT ANGLES

FIREFIGHTERS' TELEPHONE JACK

EMERGENCY PAGING SPEAKER INSTALLATION

SEISMIC DEVICES

SIGNAGE ENGRAVING FILLED WITH BLACK  
PAINT OR APPROVED ETCHING PROCESS

NO VISIBLE COMPANY NAME OR LOGO

WIRING DIAGRAMS, OPERATING  
INSTRUCTIONS, AND PARTS ORDERING  
INFORMATION

NON-PROPRIETARY CONTROL SYSTEM AND  
DIAGNOSTICS PROVISIONS

B. Future Passenger/Patient Elevators:

NUMBER:	CARS ( 2 FUTURE)
CAPACITY:	5000 #
CLASS LOADING:	SERVICE CLASS C1
CONTRACT SPEED:	350 FPM
ROPING:	1:1
MACHINE:	GEARED
MACHINE LOCATION:	OVERHEAD
OPERATIONAL CONTROL:	SELECTIVE COLLECTIVE MICROPROCESSOR BASED SYSTEM

MOTOR CONTROL:	AC VARIABLE VOLTAGE VARIABLE FREQUENCY MICROPROCESSOR BASED WITH DIGITAL CLOSED-LOOP FEEDBACK
POWER CHARACTERISTICS:	480 VOLTS, 3 PHASE, 60 HERTZ
STOPS:	4
OPENINGS:	4
FLOORS SERVED:	3, 4, 6, 7
TRAVEL:	52'-6" ±
PLATFORM SIZE:	6'-0" WIDE X 9'-8" DEEP
MINIMUM CLEAR INSIDE CAR:	5'-8" WIDE X 8'-9" DEEP
ENTRANCE SIZE:	4'-6" WIDE X 7'-0" HIGH
ENTRANCE TYPE:	TWO SPEED, SIDE OPENING
DOOR OPERATION:	HIGH SPEED, HEAVY-DUTY, DOOR OPERATOR, MINIMUM OPENING SPEED 2-1/2 F.P.S.
DOOR PROTECTION:	INFRARED, FULL SCREEN DEVICE
SAFETY:	FLEXIBLE GUIDE CLAMP-TYPE B, CAR
GUIDE RAILS:	PLANED STEEL TEES
BUFFERS:	OIL
COMPENSATION:	PROVIDER'S STANDARD APPLICATION AS REQUIRED
CAR ENCLOSURE:	SUBMIT BROCHURES DEPICTING MANUFACTURER'S FULL RANGE FOR SELECTION  8'-0" CLEAR HEIGHT UNDER CANOPY  BATTERY POWERED EMERGENCY CAR LIGHTING. PROVIDE SEPARATE CONSTANT PRESSURE TEST BUTTON IN CAR SERVICE COMPARTMENT.
SIGNAL FIXTURES:	LED ILLUMINATION PROVIDER'S STANDARD
HALL AND CAR PUSHBUTTON STATIONS:	SINGLE HALL CALL REGISTRATION RISER
CAR POSITION INDICATORS:	SINGLE DIGITAL WITH CAR DIRECTION ARROWS

	SECURITY CONTROL PANEL
	FIREFIGHTERS' CONTROL PANEL
HALL LANTERNS:	AT ALL FLOORS WITH VOLUME ADJUSTABLE ELECTRONIC CHIME OR TONE. SOUND TWICE FOR DOWN DIRECTION
COMMUNICATION SYSTEM:	SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL, TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING AND VOICELESS COMMUNICATION
FIXTURE SUBMITTAL:	SUBMIT BROCHURE DEPICTING MANUFACTURER'S FULL RANGE OF FIXTURES FOR SELECTION
ADDITIONAL FEATURES – (CARS ((2 FUTURE) ):	CAR AND COUNTERWEIGHT ROLLER GUIDES
	CAR TOP INSPECTION STATION
	FIREFIGHTERS' SERVICE, PHASE I AND II, INCLUDING ALTERNATE FLOOR RETURN
	STANDBY POWER TRANSFER (AUTOMATIC TO MAIN FLOOR) WITH MANUAL OVERRIDE IN FIREFIGHTERS' CONTROL PANEL
	ACCESSIBILITY SIGNAGE
	SWING CAR RETURN PANEL(S) ARRANGED FOR INTEGRAL CAR OPERATING PANEL(S)
	HOISTWAY ACCESS SWITCHES TOP AND BOTTOM FLOORS
	HOISTWAY DOOR UNLOCKING DEVICE ALL FLOORS
	PLATFORM ISOLATION
	LOAD-WEIGHING DEVICE
	ANTI-NUISANCE FEATURE
	INDEPENDENT SERVICE FEATURE
	CARD READER PROVISIONS
	CCTV PROVISIONS
	DIGITAL VIDEO DISPLAY PROVISIONS
	SECURITY CONTROL PANEL AND REMOTE WIRING



FIREFIGHTERS' CONTROL PANEL AND REMOTE WIRING

MACHINE, POWER CONVERSION UNIT, AND CONTROLLER SOUND ISOLATION

TAMPER RESISTANT FASTENERS FOR ALL FASTENINGS EXPOSED TO THE PUBLIC

ONE YEAR WARRANTY MAINTENANCE WITH 24-HOUR CALL-BACK SERVICE

SILL SUPPORT ANGLES

FIREFIGHTERS' TELEPHONE JACK

EMERGENCY PAGING SPEAKER INSTALLATION

SEISMIC DEVICES

SIGNAGE ENGRAVING FILLED WITH BLACK PAINT OR APPROVED ETCHING PROCESS

NO VISIBLE COMPANY NAME OR LOGO

WIRING DIAGRAMS, OPERATING INSTRUCTIONS, AND PARTS ORDERING INFORMATION

NON-PROPRIETARY CONTROL SYSTEM AND DIAGNOSTICS PROVISIONS

C. AGV Elevator:

NUMBER:	CAR F LIFT
CAPACITY:	4500 #
CLASS LOADING:	SERVICE CLASS C1
CONTRACT SPEED:	300 FPM
ROPING:	1:1
MACHINE:	GEARED
MACHINE LOCATION:	OVERHEAD
OPERATIONAL CONTROL:	SELECTIVE COLLECTIVE MICROPROCESSOR BASED SYSTEM
MOTOR CONTROL:	AC VARIABLE VOLTAGE VARIABLE FREQUENCY MICROPROCESSOR BASED WITH DIGITAL CLOSED-LOOP FEEDBACK

POWER CHARACTERISTICS:	480 VOLTS, 3 PHASE, 60 HERTZ
STOPS:	4 (+2 FUTURE)
OPENINGS:	4 (+2 FUTURE)
FLOORS SERVED:	1-4, (FUTURE 6-7)
TRAVEL:	84'-0" ±
PLATFORM SIZE:	5'-4" WIDE X 10'-4 ¾" DEEP
MINIMUM CLEAR INSIDE CAR:	5'-0" WIDE X 8'-10 ¼" DEEP
ENTRANCE SIZE:	3'-6" WIDE X 7'-0" HIGH
ENTRANCE TYPE:	TWO SPEED, SIDE OPENING
DOOR OPERATION:	HIGH SPEED, HEAVY-DUTY, DOOR OPERATOR, MINIMUM OPENING SPEED 2-1/2 F.P.S.
DOOR PROTECTION:	INFRARED, FULL SCREEN DEVICE
SAFETY:	FLEXIBLE GUIDE CLAMP-TYPE B, CAR
GUIDE RAILS:	PLANED STEEL TEES
BUFFERS:	OIL
COMPENSATION:	PROVIDER'S STANDARD APPLICATION AS REQUIRED
CAR ENCLOSURE:	SUBMIT BROCHURES DEPICTING MANUFACTURER'S FULL RANGE FOR SELECTION  8'-0" CLEAR HEIGHT UNDER CANOPY  BATTERY POWERED EMERGENCY CAR LIGHTING. PROVIDE SEPARATE CONSTANT PRESSURE TEST BUTTON IN CAR SERVICE COMPARTMENT.
SIGNAL FIXTURES:	LED ILLUMINATION PROVIDER'S STANDARD
HALL AND CAR PUSHBUTTON STATIONS:	SINGLE HALL CALL REGISTRATION RISER
CAR POSITION INDICATORS:	MATCH EXISTING  SECURITY CONTROL PANEL  FIREFIGHTERS' CONTROL PANEL
HALL LANTERNS:	MATCH EXISTING

COMMUNICATION SYSTEM:

SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL, TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING AND VOICELESS COMMUNICATION

FIXTURE SUBMITTAL:

SUBMIT BROCHURE DEPICTING MANUFACTURER'S FULL RANGE OF FIXTURE FOR SELECTION

ADDITIONAL FEATURES –

(CAR F LIFT );

CAR AND COUNTERWEIGHT ROLLER GUIDES

CAR TOP INSPECTION STATION

FIREFIGHTERS' SERVICE, PHASE I AND II, INCLUDING ALTERNATE FLOOR RETURN

STANDBY POWER TRANSFER (AUTOMATIC TO MAIN FLOOR) WITH MANUAL OVERRIDE IN FIREFIGHTERS' CONTROL PANEL

ACCESSIBILITY SIGNAGE

SWING CAR RETURN PANEL(S) ARRANGED FOR INTEGRAL CAR OPERATING PANELS

HOISTWAY ACCESS SWITCHES  
TOP AND BOTTOM FLOORS

HOISTWAY DOOR UNLOCKING DEVICE  
ALL FLOORS

PLATFORM ISOLATION

LOAD-WEIGHING DEVICE

ANTI-NUISANCE FEATURE

INDEPENDENT SERVICE FEATURE

CARD READER PROVISIONS

CCTV PROVISIONS

DIGITAL VIDEO DISPLAY PROVISIONS

SECURITY CONTROL PANEL AND REMOTE WIRING

FIREFIGHTERS' CONTROL PANEL AND REMOTE WIRING

MACHINE, POWER CONVERSION UNIT, AND CONTROLLER SOUND ISOLATION

TAMPER RESISTANT FASTENERS FOR ALL  
FASTENINGS EXPOSED TO THE PUBLIC

ONE YEAR WARRANTY MAINTENANCE WITH 24-  
HOUR CALL-BACK SERVICE

SILL SUPPORT ANGLES

FIREFIGHTERS' TELEPHONE JACK

EMERGENCY PAGING SPEAKER INSTALLATION

SEISMIC DEVICES

SIGNAGE ENGRAVING FILLED WITH BLACK  
PAINT OR APPROVED ETCHING PROCESS

NO VISIBLE COMPANY NAME OR LOGO

WIRING DIAGRAMS, OPERATING  
INSTRUCTIONS, AND PARTS ORDERING  
INFORMATION

NON-PROPRIETARY CONTROL SYSTEM AND  
DIAGNOSTICS PROVISIONS

## 2.3 CAR PERFORMANCE

- A. Car Speed:  $\pm 3\%$  of contract speed under any loading condition.
- B. Car Capacity: Safely lower, stop and hold 125% of rated load.
- C. Car Stopping Zone:  $\pm 1/4"$  under any loading condition.
- D. Door Opening Time: Seconds from start of opening to fully open:
  - 1. Cars 19-20: 2.0 seconds.
  - 2. Car F Lift: 2.3 seconds.
- E. Door Closing Time: Seconds from start of closing to fully closed:
  - 1. Cars 19-20: 3.5 seconds.
  - 2. Car F Lift: 4.1 seconds.
- F. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open (1/2 open for side opening doors) and car stopped at next successive floor under any loading condition or travel direction (L3-L4; 13'-6" floor height):
  - 1. Cars 19-20: 10.8 seconds.
  - 2. Car F Lift: 11.5 seconds.
- G. Car Ride Quality
  - 1. Horizontal acceleration within car during all riding and door operating conditions. Not more than 20 mg (geared) peak to peak in the 1 - 10 Hz range.
  - 2. Acceleration and Deceleration: Smooth constant and not more than 4 feet/second<sup>2</sup> with an initial ramp between 0.5 and 0.75 second.
  - 3. Sustained Jerk: Not more than 6 feet/second<sup>3</sup>.

- H. Airborne Noise: Measured noise level of elevator equipment during operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.

## PART 3 EXECUTION

### 3.1 INSTALLATION

Comply with applicable codes, manufacturer's instructions, shop drawings and recommendations. Comply with National Electrical Code (ASME C1 by NFPA) for electrical work required during construction.

### 3.2 FINAL INSPECTION AND TEST

- A. Comply with ASME A17.2-latest edition Inspectors' Manual.
- B. Review procedure shall apply for individual elevators, portions of groups of elevators and completed groups of elevators accepted on an interim basis or elevators and groups of elevators completed, accepted, and placed into operation.
- C. Provider shall perform review and evaluation of all aspects of its work prior to requesting Architect's final review. Work shall be considered ready for Consultant's final contract compliance review when copies of Provider's test and review sheets are available for Architect's review and all elements of work or a designated portion thereof are in place and elevator or groups of elevators are deemed ready for service as intended.
- D. Furnish labor, materials, and equipment necessary for Architect's review. Notify Architect a minimum of five (5) working days in advance when ready for final review of elevator or group.
- E. Architect's written list of observed deficiencies of materials, equipment and operating systems will be submitted to Provider for corrective action. Architect's review shall include as a minimum:
  - 1. Workmanship and equipment compliance with Contract Documents.
  - 2. Contract speed, capacity, floor-to-floor, and door performance comply with Contract Documents.
  - 3. Performance of following is satisfactory:
    - a. Starting, accelerating, running
    - b. Decelerating, stopping accuracy
    - c. Door operation and closing force
    - d. Equipment noise levels
    - e. Signal fixture utility
    - f. Overall ride quality
    - g. Performance of door control devices
    - h. Operations of emergency two-way communication device
    - i. Operations of firefighters' service
    - j. Operations of seismic devices
    - k. Operations of special security features and floor lock-off provisions
    - l. Operations of remote monitoring devices
    - m. Operations of emergency brake device



## OUTLINE SPECIFICATION

### SECTION 14 24 00 HYDRAULIC ELEVATORS

#### PART 1 - GENERAL

##### 1.1 QUALITY ASSURANCE

All work shall be performed in accordance with the latest edition of the "American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks" (ASME A17.1), including published supplements; "National Electrical Code," "OSHA," "NFPA," "UBC," A.D.A. Handicapped Code, and such state and local codes as may be applicable.

#### PART 2 - PRODUCTS

##### 2.1 APPROVED PROVIDERS:

- A. Non-proprietary Controllers by MCE, Elevator Controls Corporation or Swift.
- B. Gearless and Geared Elevators: KONE, Otis, Schindler, ThyssenKrupp and Fujitec.
- C. Car Enclosure: Eklund's Inc., Gunderlin, Ltd., Hauenstein & Burmeister, KONE, Otis, Schindler, ThyssenKrupp, Tyler, Fujitec.
- D. Hoistway Entrance: Hauenstein & Burmeister, KONE, Otis, Schindler, ThyssenKrupp, Tyler, Fujitec.

##### 2.2 SUMMARY - HYDRAULIC ELEVATOR EQUIPMENT

###### A. South Core Passenger/Patient Elevators:

NUMBER:	CARS 21-22
CAPACITY:	4500 #
CLASS LOADING:	SERVICE CLASS A
CONTRACT SPEED:	150 FPM
MACHINE:	HYDRAULIC PUMP
MACHINE LOCATION:	ADJACENT AT BOTTOM LANDING
OPERATIONAL CONTROL:	DUPLEX SELECTIVE COLLECTIVE MICROPROCESSOR BASED SYSTEM
MOTOR CONTROL:	SINGLE SPEED AC WITH SCR SOFT START WITH CLOSED TRANSITION
POWER CHARACTERISTICS:	480 VOLTS, 3 PHASE, 60 HERTZ
STOPS:	3
OPENINGS:	3

FLOORS SERVED:	1-3
TRAVEL:	31'-6" ±
PLATFORM SIZE:	6'-0 WIDE X 9'-0" DEEP
MINIMUM CLEAR INSIDE CAR:	5'-8" WIDE X 8'-0" DEEP
ENTRANCE SIZE:	4'-0" WIDE X 7'-0" HIGH
ENTRANCE TYPE:	TWO SPEED, SIDE OPENING
DOOR OPERATION:	HIGH SPEED, HEAVY-DUTY, DOOR OPERATOR, MINIMUM OPENING SPEED 2-1/2 F.P.S.
DOOR PROTECTION:	3-DIMENSIONAL INFRARED, FULL SCREEN DEVICE, WITH DIFFERENTIAL TIMING NUDGING AND INTERRUPTED BEAM TIME
HYDRAULIC TYPE:	DUAL JACK HOLELESS
CAR SAFETY:	INSTANTANEOUS TYPE A
GUIDE RAILS:	PLANED STEEL TEES
BUFFERS:	SPRING
CAR ENCLOSURE:	SUBMIT BROCHURES DEPICTING MANUFACTURER'S FULL RANGE FOR SELECTION
	8'-0" CLEAR HEIGHT UNDER CANOPY
	BATTERY POWERED EMERGENCY CAR LIGHTING. PROVIDE SEPARATE CONSTANT PRESSURE TEST BUTTON IN CAR SERVICE COMPARTMENT.
SIGNAL FIXTURES:	LED ILLUMINATION PROVIDER'S STANDARD VANDAL RESISTANT ASSEMBLY
HALL AND CAR PUSHBUTTON STATIONS:	SINGLE HALL PUSHBUTTON RISER SINGLE CAR OPERATING PANEL
	VANDAL RESISTANT CAR AND HALL PUSHBUTTONS
CAR POSITION INDICATORS:	SINGLE DIGITAL WITH CAR DIRECTION ARROWS
	SECURITY CONTROL PANEL
	FIREFIGHTERS' CONTROL PANEL
HALL LANTERNS:	AT ALL FLOORS WITH VOLUME ADJUSTABLE ELECTRONIC CHIME OR TONE. SOUND TWICE FOR DOWN DIRECTION



COMMUNICATION SYSTEM:

SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL, TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING AND VOICELESS COMMUNICATION

FIXTURE SUBMITTAL:

SUBMIT BROCHURE DEPICTING MANUFACTURER'S FULL RANGE OF FIXTURES FOR SELECTION

ADDITIONAL FEATURES –

(CARS 21-22 ):

CAR ROLLER GUIDES

CAR TOP INSPECTION STATION

FIREFIGHTERS' SERVICE, PHASE I AND II, INCLUDING ALTERNATE FLOOR RETURN

STANDBY POWER TRANSFER (AUTOMATIC TO MAIN FLOOR) WITH MANUAL OVERRIDE IN FIREFIGHTERS' CONTROL PANEL

BATTERY PACK STANDBY POWER PROVISION

ACCESSIBILITY AND EMERGENCY MEDICAL SERVICES SIGNAGE

SWING CAR RETURN PANEL(S) ARRANGED FOR INTEGRAL CAR OPERATING PANEL(S)

HOISTWAY ACCESS SWITCHES  
TOP AND BOTTOM FLOORS

HOISTWAY DOOR UNLOCKING DEVICE  
ALL FLOORS

PLATFORM ISOLATION, JACK TO PLATEN CONNECTION(S)

INDEPENDENT SERVICE FEATURE

DUAL-MODE OPERATION

CARD READER PROVISIONS

CCTV PROVISIONS

SECURITY CONTROL PANEL AND REMOTE WIRING

FIREFIGHTERS' CONTROL PANEL AND REMOTE WIRING

HYDRAULIC PUMP UNIT, AND CONTROLLER  
SOUND ISOLATION

TAMPER RESISTANT FASTENERS FOR ALL FASTENINGS EXPOSED TO THE PUBLIC

ONE YEAR WARRANTY MAINTENANCE WITH 24-HOUR CALL-BACK SERVICE

SILL SUPPORT ANGLES

FIREFIGHTERS' TELEPHONE JACK

EMERGENCY PAGING SPEAKER INSTALLATION

SEISMIC SAFETY VALVE

WATERTIGHT PVC SLEEVE FOR UNDERGROUND PIPING WITH SECONDARY CONTAINMENT PROVISIONS.

SEISMIC DEVICES

SIGNAGE ENGRAVING FILLED WITH BLACK PAINT OR APPROVED ETCHING PROCESS

NO VISIBLE COMPANY NAME OR LOGO

WIRING DIAGRAMS, OPERATING INSTRUCTIONS, AND PARTS ORDERING INFORMATION

NON-PROPRIETARY CONTROL SYSTEM AND DIAGNOSTICS PROVISIONS

## 2.3 CAR PERFORMANCE

- A. Car Speed:  $\pm 10\%$  of contract speed under any loading condition.
- B. Car Capacity: Safely lower, stop and hold up to 125% of rated load.
- C. Car Stopping Zone:  $\pm 1/4"$  under any loading condition.
- D. Door Opening Time: Seconds from start of opening to fully open:
  - 1. Cars 21-22: 2.5 seconds.
- E. Door Closing Time: Seconds from start of closing to fully closed:
  - 1. Cars 21-22: 4.6 seconds.
- F. Car Floor to Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open (1/2 open for side opening doors) and car in stopping zone at next successive floor under any loading condition or travel direction (L2-L3; 16'-3" floor height):
  - 1. Cars 21-22: 16.9 seconds.
- G. Pressure: Fluid system components shall be designed and factory tested for 500 p.s.i. maximum operating pressure shall be 400 p.s.i.
- H. Noise and Vibration Control
  - 1. Airborne Noise: Measured noise level of elevator equipment and its operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.

2. Vibration Control: All elevator equipment provided under this contract, including power unit, controller, oil supply lines and their support shall be mechanically isolated from the building structure and electrically isolated from the building power supply and to each other to minimize the possibility of objectionable noise and vibrations being transmitted to occupied areas of the building.
3. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
4. All dBA readings to be taken three (3) feet off the floor and three (3) feet from the equipment using the "A" weighted scale.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

Comply with applicable codes, manufacturer's instructions, shop drawings and recommendations. Comply with National Electrical Code (ASME C1 by NFPA) for electrical work required during construction.

### 3.2 FINAL INSPECTION AND TEST

- A. Comply with ASME A17.2-latest edition Inspectors' Manual.
- B. Review procedure shall apply for individual elevators, portions of groups of elevators and completed groups of elevators accepted on an interim basis or elevators and groups of elevators completed, accepted, and placed into operation.
- C. Provider shall perform review and evaluation of all aspects of its work prior to requesting Architect's final review. Work shall be considered ready for Architect's final contract compliance review when copies of Provider's test and review sheets are available for Architect's review and all elements of work or a designated portion thereof are in place and elevator or groups of elevators are deemed ready for service as intended.
- D. Furnish labor, materials, and equipment necessary for Architect's review. Notify Architect a minimum of five (5) working days in advance when ready for final review of elevator or group.
- E. Architect's written list of observed deficiencies of materials, equipment and operating systems will be submitted to Provider for corrective action. Architect's review shall include as a minimum:
  1. Workmanship and equipment compliance with Contract Documents.
  2. Contract speed, capacity, floor-to-floor, and door performance comply with Contract Documents.
  3. Performance of following is satisfactory:
    - a. Starting, accelerating, running
    - b. Decelerating, stopping accuracy
    - c. Door operation and closing force
    - d. Equipment noise levels
    - e. Signal fixture utility
    - f. Overall ride quality
    - g. Performance of door control devices
    - h. Operations of emergency two-way communication device
    - i. Operations of firefighters' service
    - j. Operations of seismic devices
    - k. Operations of special security features and floor lock-off provisions
    - l. Operations of remote monitoring devices

