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SECTION 01631A
SUBSTITUTION REQUEST

Project_____Substitution Request No.:_____

From:_____

To: _____

Date:_____A/E Project Number: _____

Contract For: _____

Re:_____

Specification Title:_____

Description:_____

Section No.:_____Page: _____Article/Paragraph:_____

Proposed Substitution:_____

Manufacturer: _____

Address:_____Phone:_____

Trade Name: _____Model No.: _____

Installer: _____

Address: _____Phone: _____

History:
- New product
- 2-5 years old
- 5-10 years old
- More than 10 years old

Differences between proposed substitution and specified product: _____

_____

_____

- Point-by-point comparative data attached - REQUIRED BY A/E

Reason for not providing specified item: _____

_____

_____

_____

_____

_____

_____

Similar Installation:

Project: _____

Architect: _____

Address: _____

District: _____

Date Installed: _____.

Proposed substitution affects other parts of Work: • No • Yes; explain:

_____

_____

_____

_____

_____

Savings to District for accepting substitution: $_____

Proposed substitution changes Contract Time:
9 No
9 Yes [Add] [Deduct] _____ days.

_____

Supporting Data Attached: • Drawings • Product Data • Samples
• Tests • Reports • _____

_____

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, are available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signature: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

A/E'S REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01340.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01340.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____ Date_____

Additional Comments:

- Contractor
- Subcontractor
- Supplier
- Manufacturer
- A/E
- _____

END OF DOCUMENT

- FILENAME \p Z:\SPECS\public\(1) CSI WORKFILES\ANTELOPE VALLEY COLLEGE\HEALTH AND SCIENCE\(10) 07 30 09 - BID SET\ADD2 02 09 10\01631a mc ADD2.doc•

SECTION 03335
COLORED CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Colored architectural concrete topping on bridge.

B. Related work:

1. Division 2 for site concrete paving.

2. Division 3 for concrete reinforcing and cast-in-place concrete.

3. Division 7 for joint sealants.

1.2 REFERENCES

A. Design and Control of Concrete Mixtures – Thirteenth Edition; Portland Cement Association.

1.3 SUBMITTALS

A. Product data: List of products specified in this Section.

B. Shop drawings:

1. Submit shop drawings for accessories in accordance with ACI standards.

2. Paving jointing plan: Proposed layout of contraction, construction and isolation joints. Clearly delineate the three different joint types.

C. Statement of mix design: Submit mix design prepared by batch plant for each load delivered to Project. Mix design to contain following information:

1. Name, address, and telephone number of batch plant preparing statement of mix design.

2. Date of mix design.

3. Project location.

4. Contractor requesting load delivery.

5. Mix design number.

6. Integral color used.

7. Gradations for sand and aggregate.

8. Material weights, specific gravity, and absolute volumes.

9. Basis of testing.

10. Water/cement ratio.

11. PSI rating.

12. Signature of testing laboratory manager.

13. Signed stamp from registered Project structural engineer or architect.

D. Sample: 1 pound sample of surface-seeded aggregate.

1.4 QUALITY ASSURANCE

A. Quality control: Shall be maintained by licensed installers of Lithocrete throughout duration of project. Licensed installers include, but are not limited to the following:

1. Shaw and Sons Inc.

2. TB Penick and Sons Inc.

3. Other licensed installers are listed at http://www.lithocrete.com/contact.html.

B. Testing: Testing agency designated by District. Testing personnel shall meet ASTM E 329 requirements.

C. Mockups:

1. Prior to construction, provide 4 ft. x 4 in. x 4 in. thick sample panel of colored concrete paving at a location approved by the Architect.

2. Ensure that mockup contains joint types specified, i.e. construction, contraction, and isolation.

3. Approved mockups will be the standard for future colored concrete paving.

4. Remove mockups from site upon completion of Work and approval.

1.5 HANDLING

A. Store materials in a dry and protected location.

B. Keep aggregate dry at all times prior to installation.

1.6 MAINTENANCE MATERIAL

A. One 100 lb. sealed bag of aggregate specified for use by District in future repairs of damaged colored concrete paving.

B. Washed concrete sand: One 50 lb. sealed bag of washed concrete sand similar to type used during installation of colored concrete paving.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT

A. Type II, ASTM C150.

B. Use same brand of cement from single source throughout entire project.

C. Cement complying with ASTM C 150, refer to Drawings for Type.

2.2 WASHED CONCRETE SAND

A. Clean, hard, and durable washed concrete sand, conforming to ASTM C33.

B. Use same sand from single source throughout entire Project.

2.3 COARSE AGGREGATE

A. Clean, hard, and durable coarse aggregate, conforming to ASTM C33.

B. Use same aggregate from single source throughout entire Project.

2.4 LITHOCRETE SURFACE-SEEDED AGGREGATE

A. Refer to Drawings for aggregate type, size, color, and distribution percentage.

B. Use same aggregate from same source for entire Project.

2.5 WATER

A. Potable and free from deleterious materials such as oils, acids, and organic matter.

2.6 ADMIXTURES

A. Integral concrete coloring admixture: Refer to Drawings for color type and manufacturer.

1. Acceptable manufacturers:

a. L.M. Scofield.

b. Colorfull by Admixtures, Inc.

c. QC.

B. Admixtures:

1. May be used only with the Architect and DSA approval.

2. Submit manufacturer's data for products proposed for use to the Architect in compliance with the requirements of Division One.

2.7 READY MIXED CONCRETE

A. Batched, mixed and transported in accordance with ASTM C 94.

B. Polypropylene fiber reinforcement: 100 percent virgin multifilament polypropylene fibers, complying with ASTM C 1116 - Type III.

1. Acceptable manufacturers:

a. Fibermesh Fibermix Stealth, 1/4 inch long.

b. Grace Construction Products MicroFiber.

2. Application rate: 1/2 lbs/cubic yard of mix.

2.8 ISOLATION JOINT MATERIALS

A. Refer to Section 07920.

2.9 DESIGN OF MIXES AND PROPORTIONING

A. Proportion and mix of cement, aggregate, admixture and water to attain required plasticity and strength in accordance with current edition of ACI Manual of Concrete Practice and PCA "Design and Control of Concrete Mixtures."

B. Concrete mixtures to be designed by an approved commercial testing laboratory, using approved materials to obtain specified minimum compressive strength.

C. Concrete Mix Criteria:

1. Slump: 5-inch, with a 1/2-inch slump differential between successive batches. Obtain approval from Architect if slump is outside these parameters.

2. Minimum psi at 28 days: 2,500.

3. Cement quantity per yard of mix:

a. Minimum: 6-sack.

b. Maximum: 7-sack.

4. Water/cement ratio: 0.65 to 0.67.

5. Sand: 70 percent of total mix.

6. Pea gravel: 30 percent of total mix.

7. Non-chloride accelerators: Do not use corrosive accelerators such as calcium chloride.

8. Concrete delivery: Use of concrete loads exceeding 90 minutes from time of batch plant must be approved by Architect.

9. Verify that batch plant guarantees single source supply for cement, sand, and aggregate for the entire project.

PART 3 - EXECUTION

3.1 LITHOCRETE SURFACE-SEEDED AGGREGATE INSTALLTION

A. Install in accordance with US Patents 4,748,788 and #6,016,635 to match approved mockups.

B. Lithocrete process incorporates use of following patented products:

1. Lithocrete Conditioner.

2. Lithocrete Etch Retarder.

3. Lithoseal paving sealer.

3.2 JOINTING

A. Refer to ACI 302 “Guide for Concrete Floor and Slab Construction” for work under this section.

B. Construction and Contraction Joints:

1. Sawcut construction and contraction joints in locations indicated on Drawings.

2. Perform jointing with a new diamond-tip circular saw.

3. Joint width: As indicated. Do not exceed 3/16 inch in width.

4. Depth of sawcuts: 1/4th depth of slab.

5. Sawcut joints in a straight line with no overcutting.

6. Use hand tool to sawcut up to vertical edges such as walls, steps, curbs and columns. No cutting into vertical surfaces will be allowed.

C. Isolation joint sealant: Install isolation joint sealant as specified in Section 07920.

3.3 CURING

A. After initial Lithocrete aggregate exposure, continuously sprinkle or fog paving with water for minimum 7 days.

3.4 SEALING

A. Seal surface of paving using Lithocrete Sealer. Follow Lithocrete Sealer directions.

END OF SECTION

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SECTION 05082
FLUOROPOLYMER RESIN COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Section contains general specifications pertaining to fluorocarbon resin coating to be applied on metal surfaces specified in Sections 07412, 07600, 07610, 08600, 08900, 08950 and 10200.

B. Related work:

1. All other painting and shop priming.

1.2 DEFINITIONS

A. Fluoropolymer coating: Thermo-curing high performance organic coating, formulated under license, containing not less than 70 fluoropolymer resin by weight.

1.3 SUBMITTALS

A. Data: Submit paint manufacturer published literature.

B. Samples: Submit samples, as specified. After acceptance of color match by the Architect, from color samples prepared by the Contractor, prepare 6 sets of 2 samples of each to define the color and gloss range and submit them for the Architect's review.

C. Certification: Submit letter from the coating formulator to verify his acceptance of the applicator. Provide written notification of approval by a formulator prior to application of the finish.

D. Reports: Submit test reports indicating compliance of finish with the requirements specified in Article 2.1 on samples selected at random from production runs. During production, test on a daily basis on each shift for compliance with Article 2.1 herein, as verified by testing in compliance with applicable standards.

1.4 QUALITY ASSURANCE

A. Applicator qualifications: Licensed by the coating formulator.

B. Quality control program:

1. Establish and submit for approval a quality control program to assure compliance with the specified requirements.

2. Maintain complete finish process records including certified inspection records for quality finish. Provide copies of records to Architect upon request.

3. The program shall include documented procedures, processes, etc.

4. Maintain complete certified inspection, testing and process records of finishing procedures. These records shall be available to the Architect upon request.

5. Do not start application prior to approval of the quality control program.

1.5 HANDLING

A. Limitations: Do not ship to the job site materials that have not been inspected, tested and marked in the prescribed manner, does not fall within the prescribed color range, or have been rejected by the Architect.

1.6 WARRANTY

A. The fluorocarbon resin coating is included in the general warranty.

B. In addition, submit a written warranty specifically covering film integrity (5 years minimum), fade resistance as defined by ASTM D 2244 (state maximum deviation in 5 years), and chalk resistance as defined by ASTM D 659 (state maximum deviation in 5 years).

PART 2 - PRODUCTS

2.1 FORMULATOR/MATERIALS

A. Resin base manufacturer: Kynar 500 by Arkema Group or Hylar 5000 by Solvay Solexis.

B. Coating manufacturer: These Specifications are based on products made by PPG Industries, Inc. Other acceptable formulators include BASF (Fluoroceram) and Valspar Corp. (Fluropon).

C. Pretreatment:

1. Shall meet ASTM D 1730, Type B, Method 5 or Method 7.

2. Processing shall conform with ASTM B 449, Section 5.

3. Conversion coating weight shall be between 30 - 100 mg/square -foot

D. Field touchup: Coraflon ADS.

E. Standard: The finish shall meet or exceed the requirements of AAMA 26205, Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels, and the following minimum properties.

1. Gloss: reflectivity of approved sample when tested in compliance with ASTM D 523.

2. Pencil hardness: F minimum with Eagle Turquoise Pencil.

3. Dry film thickness:

a. Primer: 0.3, plus 0.1 mil.

b. Top coat: Minimum 1 mil.

4. Abrasion resistance; Coefficient of abrasion of 65 minimum when tested in compliance with ASTM D 968.

5. Solvent resistance: 100 double MEK rubs minimum.

6. Adhesion: No pick off when tape tested over 1/16-inch crosshatch wet and dry.

7. Salt spray: ASTM B 117, 5 percent solution at 100-degree F. Few scattered blisters no larger than No. 8 according to ASTM 1654 and no more than 1/16-inch creepage from areas scribed to bare metal after 4,000 hours.

8. Humidity resistance: ASTM D 2247. Few scattered blisters no larger than No. 8, according to ASTM D 714 Figure No. 4 after 3,000 hours.

9. Chalking resistance: No greater than No. 8 for colors and No. 6 for white based on ASTM D 659 after exposure for 5,000 hours in Sunshine Arc Weatherometer XWR using 60/60 cycle.

10. Color change: No greater than 5E NBS units, as determined in compliance with ASTM D 244 after removal of external deposits and after exposure for 5,000 hours in Sunshine Arc Weatherometer XWR using 60/60 cycle.

11. Boiling water: No pick off when tape testing over crosshatched area one hour after immersion in distilled boiling water.

12. Water immersion: No pick off when tape testing over crosshatched area after immersion in aerated distilled water 80-degree plus 10-degree after 500 hours.

F. Color:

1. It is the intent of these Specifications that the color variation between adjacent parts of the same finish be imperceptible to the naked eye under normal daylight conditions at the Project site.

2. To this end, submit range samples defining the maximum variation of color that can be anticipated. Samples shall be on 12-inch lengths of extrusions, and on 24-inch square sheet/plate/panels.

3. Adjacent pieces and pieces which will be within 6-inch of each other shall not vary in color by more than 1/2 the accepted range so that the variation is imperceptible to the naked eye under normal daylight conditions.

4. Inspect parts carefully in the shop, grade them for assembly compatibility and mark them for installation location.

5. In the construction of mockups, finish the various components to show the maximum variation that will exist in the actual building construction between adjacent and non-adjacent components.

PART 3 - EXECUTION

3.1 APPLICATION

A. Specified finishes are required on all material exposed to view or to weather, including cut edges.

B. Clean, prepare, pretreat surfaces to be coated, and apply coating in compliance with the coating manufacturer's instructions and these Specifications.

1. Perform pretreatment of metal surfaces in accordance with the procedure recommended by the coating manufacturer to provide the proper surface for applying the specified coating.

2. Dry film thickness of coating on exposed surfaces, when measured in accordance with ASTM D 1400 shall be not less that 33 microns, except in channel recesses and internal corners which shall be visually covered.

3. Finished surfaces, when cured, shall be visibly free of flow marks, streaks, sags, blisters or other surface imperfections, such as scratches, scrapes and dents, spots, stain, and streaks, and extrusion die lines or other extrusion streaks/lines.

4. Coated surfaces shall be uniform in thickness and color, smooth and free from blemishes in the coating that might impair the serviceability or detract from the general appearance of the member when viewed from 5 -foot away, and shall match the approved samples.

5. Finish shall match in gloss, and fall within the color range of the approved samples.

6. Material may not be finished more than once and material that has been finished and is not acceptable shall be scrapped.

7. Aluminum that does not receive an organic coating shall receive and Alodine conversion coating as a minimum. No mill finish aluminum is acceptable.

8. Finishing shall be performed after fabrication.

C. The Architect will have final authority to accept or reject material not meeting these finishing standards or other requirements of the Specification.

D. Coatings which do not comply with Specification requirements or do not match approved samples shall be stripped and re-coated, or the Contractor shall furnish new material with the required coating.

3.2 FIELD QUALITY CONTROL

A. After erection or installation, touchup abrasions in the surface coating, using an air-drying fluorocarbon resin finish similar to Megaflon by PPG, when the touchup work is acceptable to the Architect; otherwise strip and recoat the damaged part.

END OF SECTION

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SECTION 05120
STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUMMARY

A. Provisions of Division 01 apply to this section

B. Section Includes:

1. Structural steel.

C. Related Sections:

1. Section 01420: Testing and Inspection.

2. Section 05410: Load-Bearing Metal Studs.

3. Section 05315: Metal Decking

4. Section 05500: Metal Fabrication

5. Section 09900: Paints and Coatings

1.2 REFERENCES

A. California Building Code (CBC), Chapter 22A, 2007 Edition.

B. AISC Standards – AISC 303-05 - Code of Standard Practice for Steel Buildings and Bridges; AISC 360-05 - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings; AISC 341-05 – Seismic Provisions for Structural Steel Buildings; AISC 358-05 – Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications.

C. AWS Standards - AWS D1.1, Structural Welding Code.

D. Structural Joint Reference Specification - The Specifications for Structural Joints Using ASTM A325 or ASTM A490 Bolts established by the Research Council On Riveted and Bolted Structural Joints of the Engineering Foundation, hereinafter referred to as "Ref Spec".

1.3 SUBMITTALS

A. Shop Drawings:

1. Submit Shop Drawings, including complete details and schedules for fabrication and shop assembly of members, and details, schedules, procedures and diagrams showing the sequence of erection. Fully detail minor connections and fastenings not shown or specified in the Contract Documents to meet required conditions using similar detailing as shown in the Contract Documents. Include a fully detailed, well controlled sequence and technique plan for shop and field welding that minimizes locked in stresses and distortion; submit sequence and technique plan for review by the Architect.

a. Include details of cuts, connections, camber, and holes in accordance with Figure 4.5 of AWS D1.1-02 or AISC 360 Section J1.8, weld position plan and other pertinent data. Indicate welds by standard AWS symbols, and show size, length and type of each weld.

b. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed for Work specified in other sections.

c. Erection and Bracing Plan and Erection Procedure: Submit an erection and framing plan, including columns, beams, and girders, prepared, signed and sealed by a structural engineer registered in the State of California in accordance with Title 8 CCR, Section 1710. Maintain a copy at the Project site as required by the California Division of Industrial Safety.

d. Submit a list of steel items to be galvanized.

B. Product Data:

1. Submit copies of fabricator's specifications and installation instructions for the following products. Include laboratory test reports and other data required demonstrating compliance with these Specifications:

a. Structural steel, each type; including certified copies of mill reports covering chemical and physical properties.

b. Welding electrodes.

c. Welding gas.

d. Unfinished bolts and nuts.

e. Structural steel primer paint.

f. High-strength bolts, including nuts and washers.

C. Manufacturer's Mill Certificate: Submit, certifying that products meet or exceed specified requirements.

D. Mill Test Reports: Submit manufacturer's certificates, indicating structural yield and tensile strength, destructive and non-destructive test analysis.

E. Charpy-V-Notch (CVN) Impact Test: Submit certified copies of Charpy-V-Notch (CVN) Impact Test by the manufacturer for applicable steel members and components.

1. Charpy-V-Notch (CVN) Impact Test for Base Metal: Moment frame columns, girders and other structural steel which is to be complete joint penetration welded and subjected to Charpy-V-Notch impact test in accordance with ASTM E 23 and ASTM A 673.

2. Exception: Rolled shapes with flange thickness exceeding 2 inches that are spliced via complete joint penetration (CJP) welds shall be tested in accordance with ASTM A6/A6M, Supplementary Requirement S30, Charpy V-Notch Impact Test for Structural Shapes – Alternate Core Location. The impact test shall meet a minimum average value of 20 ft-lbs at 70° F.

3. Charpy-V-Notch test shall be performed by the manufacturer employing Test Frequency (P) in accordance with ASTM A 673 and utilizing standard specimen sizes shown in

Figure 6 of ASTM E 23. The absorbed energy in a CVN impact test shall not be less than that specified in Material Part 2 of this section.

F. Submit certified copies of tests by manufacturer for fine grain practice. Structural steel base material, as described above, shall be manufactured using fully killed fine grain practice having grain size number 5 or better as determined by ASTM E 112.

G. Weld Procedures: Submit weld procedures for all connections. Weld procedures shall be prequalified or qualified as described in AWS D1.5, Section 5.12 or 5.13 for self shielded FCAW, Weld procedures shall indicate joints details and tolerances, preheat and interpass temperature, post-heat treatment, single or multiple stringer passes, peening of stringer passes for groove welds except for the first and the last pass, electrode type and size, welding current, polarity and amperes and root treatment. The welding variables for each stringer pass shall be recorded and averaged, from these averages the weld heat input shall be calculated. Welding shall not proceed until WPS have been reviewed and approved by the Engineer of Record and DSA.

H. Welder's Certificates: Field welders shall be Project certified in accordance with AWS D1. 1-02. Shop welders shall be Project certified for FCAWS in accordance with AWS D1. 1-02.

I. Test Reports: Submit reports of tests conducted on shop and field welded and bolted connections. Include data on type of test conducted and test results.

J. LEED Documentation:

1. Provide documentation certifying the percentage of recycled content of metal materials based on material cost per weight.

2. Document metal materials plant location and determine if plant is within 500 miles of the Project.

1.4 QUALITY ASSURANCE:

A. Comply with the following as a minimum requirement:

1. California Building Code, 2007 Edition, Chapter 22A, specifically sections 2212A & 1704A.

2. AISC Standards – AISC 303-05 - Code of Standard Practice for Steel Buildings and Bridges; AISC 360 - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings; AISC 341-05 – Seismic Provisions for Structural Steel Buildings; AISC 358-05 – Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications.

3. AWS Standards- AWS D1.1, Structural Welding Code.

4. Structural Joint Reference Specification - The Specifications for Structural Joints Using ASTM A325 or ASTM A490 Bolts established by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation, hereinafter referred to as "Ref Spec".

B. Qualifications of Fabricator: Fabricate structural steel in shop of a licensed fabricator, AISC certified, in the same category of the scope of this project. City of Los Angeles certification in lieu of AISC certification is acceptable.

C. Requirements of Regulatory Agencies: Work of this Section shall conform to Title 8 CCR and to Subparagraph 1.2.A above.

D. Source Quality Control: Refer to Section 01450. Testing Laboratory shall perform conformance testing in accordance with CBC Section 2212A.1.

1. Identified Structural Steel: Tests are waived for steel identified by heat number, accompanied by mill analyses and mill test reports, and properly tagged with an Identification Certificate so as to be readily identified for conformance with applicable ASTM. Comply with CBC Section, 2212A and/or 1704A.

2. Unidentified Structural Steel: Steel not identified and certified as specified above shall be tested according to following requirements. Structural steel fabricator shall cut samples under direction of the Special Inspector and Testing Laboratory shall machine or otherwise prepare the specimens and perform testing of each 5 tons or fraction thereof for each size of unidentified steel except, in the case of random pieces or of steel having Fy greater than 36 Ksi, testing of each piece is required. Tests required are:

a. For pipe, one tension and elongation test and one flattening test for each size.

b. For all other steel, one tension and elongation test and one bend test for each size.

c. Contractor shall reimburse to Owner all costs paid by Owner for testing unidentified steel.

3. Testing of High Strength Bolts, Nuts, and Washers: According to CBC Section 2212A.2.

4. Testing of End-Welded Studs: As specified in Section 05065.

E. Erection and Bracing Plan and Procedure: Refer to Section 1710, Title 8, CCR, and Building Code. Employ and pay a California registered civil engineer to prepare an erection and bracing plan and erection procedure for structural steel including columns, beams, and girders, who shall be solely responsible for its compliance. Follow the plan and procedure exactly. Keep a copy at the job site as required by California Division of Industrial Safety. File two copies of stamped erection and bracing plan and procedure for record purposes only, not for review or approval.

F. Testing & Inspection shall comply with the following:

1. CBC Section 2212A.1 Tests of Structural Steel. All steel used for structural purposes shall be identified as required by CBC Section 2203A. Manufacturer's mill analyses and test reports are acceptable for properly identified steel, but the enforcement agency may require additional testing to determine the quality of the steel if there is any doubt as to its acceptability. Any steel not properly identified shall be tested to meet the minimum chemical and mechanical requirements of the ASTM standard appropriate for the steel specified for the structure.

2. EXCEPTION: No mechanical tests are required for unidentified steel when the minimum yield stress required by the design is less than or equal to 25 ksi (172 Mpa) and the steel is not part of the designated lateral-force-resisting system.

3. CBC Section 2212A.2 Tests of High-strength Bolts, Nuts and Washers. High-strength bolts, nuts and washers shall be sampled and tested by an approved independent testing laboratory for conformance with the requirements of Division III.

4. CBC Section 2212A.3 Tests of End-welded Studs. End-welded studs shall be sampled, tested and inspected per the requirements of the Structural Welding Code – Steel, published by the American Welding Society.

5. CBC Section 1704A.3.2.1 Inspection of Shop Fabrication. Inspection of shop fabrication shall be required for significant structural detailed connection and fabrication work as directed by the enforcement agency. This inspection shall be made by a qualified inspector approved by the enforcement agency. The inspector shall furnish the architect, structural engineer and the enforcement agency with a report that the materials and workmanship conform to the approved plans and specifications.

6. CBC Section 1704A.3.1.1 Inspection of Welding. Inspection of all shop and field welding operations, including the installation of automatic end-welded stud shear connectors shall be made by a qualified welding inspector approved by the enforcement agency. Such inspector shall be a person trained and thoroughly experienced in inspecting welding operations. The inspector's ability to distinguish between sound and unsound welding shall be reliably established. The minimum requirements for a qualified welding inspector shall be as those for an AWS certified welding inspector (CWI), as defined in the provisions of the ANSI/AWS QCI-1-96, Standard for AWS Certification of Welding Inspectors published by the American Welding Society. All welding inspectors shall be approved by the enforcement agency.

7. The ability of each welder to produce sound welds of all types required by the work shall be established by welder qualification satisfactory to the enforcement agency.

8. Welding inspection of structural welding shall conform to the requirements of AWS D1.1 Structural Welding Code – Steel, published by the American Welding Society, except as modified by this section.

9. Welding inspection of cold-formed steel members shall conform to the requirements of AWS D1.3.

10. The welding inspector shall make a systematic record of all welds. This record shall include in addition to other required records:

    a. Identification marks of welders.

    b. List of defective welds.

    c. Manner of correction of defects.

11. The welding inspector shall check the material, equipment, details of construction and procedure, as well as the welds. The inspector shall also check the ability of the welder. The inspector shall verify that the installation procedure for automatic end-welded stud shear connectors is in accordance with the requirements of AWS D1.1, Structural Welding Code – Steel, published by the American Weld Society and the approved plans and specifications. The inspector shall furnish the architect, structural engineer and the enforcement agency with a verified report that the welding is proper and has been done in conformity with AWS D1.1, Structural Welding Code – Steel, published by the American Welding Society and the approved plans and specifications. The inspector shall use all means necessary to determine the quality of the weld. The inspector may use gamma ray, magnaflux, trepanning, sonics or any other aid to visual inspection, which the inspector may deem necessary to be assured of the adequacy of the welding.

12. EXCEPTION: Plant welding inspection of open-web steel joists may be waived with the approval of the enforcement agency where welding inspection is provided at the jobsite.

13. CBC Section 1704A.3.3 Inspection of High Strength Bolt Installations. Inspection of high-strength bolt installations shall be made by an inspector specially approved for that purpose by the enforcement agency. The inspector shall check the materials, equipment, details of construction and installation procedure. The inspector shall furnish the architect, structural engineer and the enforcement agency with a report that the work has been completed in every material respect in compliance with the approved plans and specifications.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store structural steel above grade on platforms, skids or other supports.

B. Protect steel from corrosion.

C. Store welding electrodes in accordance with AWS D 12.1. Deliver electrodes to the site in unbroken packages bearing the manufacturer's name and label identifying the contents.

D. Store other materials in a weathertight and dry place until installed into the Work.

1.6 PROJECT SITE CONDITIONS

A. Site Measurements: Take field measurements as required. Report any major discrepancy between Drawings and field dimensions.

B. Protection of Floors: Use caution to protect floor slab and adjacent Work from damage. Do not overload floors. Use rubber tired equipment to handle and move steel. Do not place steel members directly on floor; use pads of timber or like material for cushioning.

C. Temporary Flooring: Provide necessary temporary planking, scaffolding, and flooring for erection of structural steel or support of erection machinery. Conform use of temporary floors or steel decking to Code.

D. Connection of Steel Decking Temporary Flooring: Temporarily weld steel decking to supports where used as a working platform. Distribute concentrated loadings from welding machines and other heavy machinery with planking or equal. Replace decking damaged by use as a working platform at no additional contract cost.

PART 2 - PRODUCTS

2.1 GENERAL

A. Stock Materials: Provide exact materials, sections, shapes, thickness, sizes, weights, and details of construction indicated on Drawings. Changes because of material stock or shop practices will be considered if net area of shape or section is not reduced thereby, if material and structural properties are at least equivalent, and if overall dimensions are not exceeded.

2.2 MATERIALS

A. Steel shapes: ASTM A992, or ASTM A572 GR 50.

B. Steel plates: ASTM A36 and A572-GR50 as noted on drawings.

C. Steel tubing: ASTM A500, Grade B, Fy = 46 ksi.

D. Steel pipe: ASTM A120 standard weight for general use; ASTM A53 Grade B where used for structural purposes.

E. Bolts and nuts: ASTM A307.

F. High-strength bolts, nuts, and washers: ASTM A325 or ASTM A490 as indicated for the bolts, ASTM A563 Grade C for nuts, and ASTM F436 for carburized washers. All high-strength bolts shall have a suitable identifying mark placed on top of bolt head at the factory. Refer to drawings for bolt specification requirements.

G. Anchor Bolts: ASTM A36, A307, or A354 GR BD Bolts as specified per contract documents.

H. Electrodes: AWS D5.1, E70XX Series Low Hydrogen Electrodes as required for intended use. All electrodes shall have a minimum Notch -Toughness of 20 FT-Lb at -20 degree F.

I. Primer: Use types acceptable to governing air quality management officials.

1. For above-grade locations: Lead free metal primer, Tnemec 10-99 or Rust-Oleum X-60.

2. For below grade applications: Coal-tar epoxy coating, two coats, 5 mils per coat. Perma Bar, as manufactured by Karlee Co., Burbank, CA, or equal. Touch-up on job site with Perma-Bar coal-tar epoxy, match finish coat thickness.

J. Non-shrink grout: Master Builders "Embeco 636", or equal, non-gas-forming, free of oxidizing catalysts and inorganic accelerators, performance and characteristics when mixed to a fluid consistency meeting CRD-C-79 and CRD-C-588, non-staining type in exposed areas.

K. Clevis & Turnbuckle materials to be C-1035 and shall have the capacity to resist loads equal to or greater than those specified in the Manual of Steel Construction – Allowable Stress Design, Ninth Edition Tables on 4-148 & 4-149. Supply Structural Engineer of Record evidence of conformance to the specified classifications and capacities.

2.3 FABRICATION

A. Cleaning and Straightening: Thoroughly wire brush material, clean of loose mill scale and rust, and straighten by methods that will not injure the steel prior to fabrication. Remove twists or bends after punching or working component parts of a member before the parts are assembled. Produce finished members free from twists, bends, and open joints when erected.

B. Contact: Pin components parts of built-up members and maintain in close contact using clamps or temporary bolting during welding operations. Accurately mill compression bearing surfaces of joints depending on contact bearings or saw cut square to axis, or as detailed. Cut other joints straight and true.

C. Joining: Provide members of the sizes, weights, shapes, and arrangements indicated, closely fitted and finished true to line and in precise position as necessary to allow proper joining of parts in the field. Drifting to enlarge unfair holes is not allowed without prior approval.

D. Drilling, Punching, and Reaming: Hole burning to make or enlarge previous holes is allowed only with prior approval. Prepare required holes in structural steel members for attachment or passage of Work of other trades. Precisely locate finished holes to ensure passage of all bolts through steel assemblies without drifting. Enlarge holes only by reaming. Poor matching of holes is cause for rejection.

E. Holes For Anchor Bolts: Punch and drill or ream holes in base and bearing plates. Do not make or enlarge the holes by burning except for grouting holes in column bases without prior approval by the Architect.

F. Gas Cutting: Use of a cutting torch is allowed where the metal being cut is not stressed during the operation, and provided stresses are not transmitted through a flame-cut surface. Make all gas cuts with a smooth regular contour. Deduct 1/8" from width of gas cut edges to determine effective width of members that are gas cut. Make radius of reentrant gas cuts as large as possible, but 1" minimum.

G. Comply with applicable provisions of AISC “Code of Standard Practice”, Section 10 “Architecturally Exposed Structural Steel (AESS)” for all exposed structural steel.

H. Galvanizing: After fabrication, items indicated or specified to be galvanized shall be galvanized in largest practical sizes. Fabrication includes operations of shearing, punching, bending, forming, assembling or welding. Galvanized items shall be free from projections, barbs, or icicles resulting from the galvanizing process.

I. Welding:

1. Type of steel furnished in welded structures shall provide chemical properties suitable for welding as determined by chemical analysis. Welds shall conform to the requirements of CBC Chapter 17A.

2. Materials and workmanship shall conform to the requirements specified herein and to CBC requirements, modified as follows:

a. No welded splices shall be permitted except those indicated on Drawings unless specifically reviewed by the Architect.

b. Drawings will designate joints in which it is important that welding sequence and technique be controlled to minimize shrinkage stresses and distortion.

3. Welding shall be performed in accordance with requirements of the AWS Structural Welding Code.

J. Shop Finish:

1. Apply finish to all members except those to receive cementitious fireproofing.

~~1.~~2. Notify the IOR when Work is ready to receive shop prime coat. Work shall be inspected by the IOR before installation of primer.

~~2.~~3. Structural steel and fittings, except galvanized items, which will be exposed when building is completed, shall receive a coat of primer.

~~3.~~4. The primer specified shall be spray applied, filling joints and corners and covering surfaces with a smooth unbroken film. The minimum dry film thickness of the primer shall be 2.0 mils.

2.4 CONNECTIONS:

A. Make connections with bolts as noted on the Structural Drawings.

B. High-Strength Steel Bolting: For joints connected by high strength steel bolts, hardened washers, and nuts tightened to high tension, conform materials, method of installation and

tension control, and wrenches to Reference Standards and CBC Chapter 22A, Division III. Install all high-strength bolts under inspection required by CBC Section 1704A.3.3.

1. Connections shall be the “bearing bolt type” (A325-N) unless noted to be “slip-critical” (A325-SC and A490-SC). Refer to drawings. All bolts of Seismic Load Resisting System (SLRS) shall be pretensioned meeting the requirements for slip critical fraying surfaces in accordance with AISC 360-05, Section J3.8 with a class ‘A’ surface per section 7.2 of AISC 341-05.

2. Bolt lengths shall be the grip plus 1-1/4".

3. Tightening of nuts shall be done with properly calibrated wrenches or by the turn-of-the-nut method for A325-SC and A490-SC bolts. Tightening of the nuts for A325-N bolts to snug tightness shall be to Ref. Spec. Allowable bolt stresses shall conform to CBC Chapter 22A and referenced standards.

4. Check calibrated wrenches individually for accuracy not less than once daily for actual conditions of application.

5. Clean all contact surfaces of bolted parts and threads free of scale, slag, burrs, pits, dirt, paint, and other foreign material or defects which would prevent solid seating of connected parts.

6. Install hardened washers per AISC Standards and CBC Chapter 22A.

7. Tighten bolts systematically from most rigid part of connection to the free edges.

8. Retighten first installed bolts that may have loosened by tightening of subsequent bolts so all bolts are tightened to correct tension.

9. Mark fully tightened bolts with identifying symbol.

10. The contractor shall torque test 25% of the bolts in connections designated with A325-SC or A490-SC Bolts.

C. Welded Stud Connectors: Conform to requirements of Section 05065.

D. Load Indicator Washers: As manufactured and licensed by Cooper and Turner, Bethlehem Steel, or approved equal, may be used for the field installation of the high-strength bolts. Load indicator washers may not be substituted for any required washer, but may be used in conjunction with the required washers. Conform tightening to Paragraph 5e of the Reference Spec listed under Section 1.2 . After sufficient bolts in a joint are snugged to bring the members into close contact, tightening shall progress from the most rigid part to the free edges until the load indicators on all bolts are closed to the required gap of 0.015" under bolt heads or 0.010" under the nuts. Do not completely close the gap to prevent overtightening and damage to the bolts. Conform to ASTM F959, A325 and A490.

E. Tension Set or Load Indicator Bolts, Nuts, and Washers: As manufactured by Cold Form Specialties, Bethlehem Steel, or approved equal, may be used for field installation of the high-strength bolts. In multi-bolt joints, the nuts shall be tightened in stages (a little at a time) without breaking the spline in any of them until the final stage, to minimize slackening of the installed bolts.

2.5 WELDING:

A. Conform to CBC Section 1704A.3.1.1, AWS D1.1 as modified by referenced AISC Standards, and as indicated or noted on Drawings. Employ welding operators qualified in accordance with AWS D1.1, as applicable, who are thoroughly trained and experienced in arc welding and that produce uniformly reliable groove and fillet welds in flat, vertical, and overhead positions, and make neat and consistent welds. Weld all structural steel joints by shielded electric-arc method unless otherwise shown, specified, or approved. Conform welding in both shop and field, including the prequalification of welds and welder qualifications, to AWS D1.1.

B. Storage and Care of Electrodes: Coatings of low-hydrogen type electrodes shall be thoroughly dry as used. Conform to AWS D1.1; use electrodes as taken from hermetically sealed packages within time limit specified therein after package is opened. Electrodes not used within allowable time period and electrodes that have been exposed more than one hour to air having a relative humidity of 75% or greater, or as required by the manufacturer, shall be dried according to AWS D1.1 before they are used, or shall be reconditioned according to electrode manufacturer's recommendations. Electrodes so dried or reconditioned not used within allowable time period after drying is completed shall be redried before use. Electrodes of any class that have been wet shall not be used under any conditions.

C. Preparation: Clean steel surfaces to be welded of all paint, grease, oil, mill scale, and foreign matter. Clean weld each time the electrode is changed. Chip full surface of hand guided and controlled flame cut edges before welding. Surfaces prepared with automatic or mechanically guided and controlled equipment need not be ground or chipped before welding.

D. Weld Finishing: Grind exposed welds subject to contact to smooth surfaces free of holes, slag, or other defects, flush with the adjoining surfaces. No finish treatment is required for permanently concealed welds and other exposed welds.

E. Procedures: During assembling and welding, hold components of a built-up member with adequate clamps or other means to keep parts straight and in close contact. Do no welding in wind until adequate protective screening is set up. Cut out defective welds or parts of welds with a chisel or air arc and replace.

F. Weld Characteristics: Conform to AWS D1.1, Chapter 8, Statically Loaded Structures. Clean and wire brush all welds. Visual inspection of finished welds must show uniform section, smoothness of welded metal, feather edges without undercuts or overlays, freedom from porosity and inclusions, and good fusion and penetration into base metal at edges and ends of fillet welds.

2.6 SHOP PRIMING

A. Clean surfaces according to AISC Specifications. Apply one shop coat of specified metal primer to minimum 1.0 mil dry film thickness. Work primer into joints. Do not prime the following:

1. Steel surfaces embedded in concrete or masonry with the exception of those steel surfaces that support anchored brick veneer.

2. Contact surfaces of high-strength bolted connections or field welded connections.

3. Surfaces to receive directly adhered fireproofing.

2.7 SHOP AND FIELD QUALITY CONTROL

A. A special inspector, approved by DSA to inspect the Work of this section, shall inspect high-strength bolted connections. The Owner will provide a DSA approved independent testing laboratory to perform tests and prepare test reports in accordance with CBC 2212A and 1704A.

The IOR shall be responsible for monitoring the work of the special inspector and testing laboratories to ensure that the testing program is satisfactorily completed.

B. An AWS CWI certified special inspector, approved by DSA to inspect the Work of this section, shall inspect welded connections. The Owner will provide a DSA approved independent testing laboratory to perform tests and prepare test reports in accordance with CBC 2212A and 1704A. The IOR shall be responsible for monitoring the work of the special inspector and testing laboratories to ensure that the testing program is satisfactorily completed.

C. The independent testing laboratory shall conduct and interpret test and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

D. Provide access to all places where structural steel Work is being fabricated or produced so required inspection and testing can be performed.

E. The independent testing laboratory may inspect and/or test structural steel at plant before shipment; however, Architect reserves the right at any time before Final Completion to deem materials not in compliance with the specified requirements as defective Work.

F. Correct defects in structural Work when inspections and laboratory test reports indicate noncompliance with specified requirements. Perform additional tests as may be required to reconfirm noncompliance of original Work, and as may be required to show demonstrate compliance of corrected Work.

G. Welding: Inspect and test during fabrication and erection of structural steel assemblies as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in the Work. Record Work required and performed to correct deficiencies.

2. Inspect welds. Welds shall be visually inspected before performing any non-destructive testing. Groove weld shall be inspected by ultrasonic or other approved non-destructive test methods. Testing shall be performed to AWS D1.1 Table 6.3 cyclically loaded non-tubular connections.

3. Ultrasonic testing shall be performed by a specially trained and qualified technician who shall operate the equipment, examine welds, and maintain a record of welds examined, defects found, and disposition of each defect. Repair and test defective welds.

4. Rate of Testing: Complete joint penetration welds contained in joints and splices shall be tested 100 percent either by ultrasonic testing or by radiography.

5. Welds, when installed in column splices, shall be tested by either ultrasonic testing or radiography.

6. Base metal thicker than 1-1/2 inches, when subjected to through-thickness weld shrinkage strains, shall be ultrasonically inspected by shear wave methods for discontinuities directly behind such welds. Tests shall be performed at least 48 hours after completed joint has cooled down to ambient air temperature.

7. Any material discontinuities shall be reviewed based on the defect rating in accordance with the criteria of AWS D1.1 table 6.3 by the Architect and DSA.

8. Other method of non-destructive testing and inspection, for example, liquid dye penetrate testing, magnetic particle inspection or radiographic inspection may be performed on weld if required.

9. Lamellar Tearing: Lamellar-tearing resulting from welding is a crack (with zero tolerance) and shall be repaired in accordance with AWS D1.1.

10. Lamination: The rejection criteria shall be based on ASTM A 435.

11. Where testing reveals lamination or conditions of lamellar tearing in base metal, the steel fabricator shall submit a proposed method of repair for review by the Architect. Test repaired areas as required.

12. Magnetic Particle Testing: Magnetic particle testing when required shall be provided in accordance with AWS D1.1 for procedure and technique. The standards of acceptance shall be in accordance with AWS D1.1 – Qualification.

H. Lamellar Tearing: Prior to welding plates 1 to 1-1/2 inches thick and greater and rolled shapes within the distance from 6 inches above the top of the joint to 6 inches below the bottom of the joint shall be checked by ultrasonic testing for laminations in base metal which may interfere with the inspection of the completed joint. Should these defects occur, members will be reviewed by the Architect and DSA. Welding procedure specifications in sub-section 1.5G specify welding practices to minimize lamellar tearing.

I. Prior Testing of Base Material: Test material before fabrication.

J. Lines and levels of erected steel shall be certified by a State of California licensed surveyor as set forth in related Division 01 section.

K. Welded studs shall be tested and inspected by the special inspector in accordance with requirements of AWS D1.1 – Stud Welding.

L. Record Drawings: After steel has been erected, correct or revise Shop Drawings and erection diagrams to correspond with reviewed changes performed in the field.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify governing dimensions and conditions of the Work before commencing erection Work.

B. Provide temporary shoring and bracing, and other support during performance of the Work. Remove after steel is in place and connected, and after cast-in-place concrete has reached its design strength.

3.2 ERECTION

A. Employ qualified riggers and plan erection to require minimum cutting. Erect members plumb, true to line and level, and in precise positions. Provide temporary bracing and guying to resist loads and stresses to which the structure may be subjected, including those due to erection equipment and its operation.

B. Anchor Bolts: Furnish and deliver anchor bolts with setting drawings and templates. Verify position of bolts prior to delivery of steel; report errors or deviation for correction.

C. Clean surfaces of base plates and bearing plates.

1. Install base and bearing plates for structural members on wedges, shims, or setting nuts as required.

2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims; cut off flush with edge of base or bearing plate before packing with grout.

D. Maintain erection tolerances of structural steel within AISC Code of Standard Practice for Steel Buildings and Bridges.

E. Align and adjust steel members. Adjust for variations in elevation or alignment. Level and plumb structural members.

F. Do not permit thermal cutting during erection of structural steel.

G. Connections: Hold steel in correct position during welding and bolting, and provide for dead loads, wind, and all erection stresses. Do no welding or final bolting until members have been aligned and plumbed.

1. Field Welding: Conform to requirements for shop fabrication.

2. Common Bolts: Tighten and upset bolt threads to preclude loosening, or use approved self-locking nuts.

3. High-Strength Bolting: Tighten by turn of the nut method or with calibrated torque wrenches as specified for the shop high-strength bolting and according to Code, AISC Standards and the Reference Standard.

H. Where indicated for field connections, provide standard bolts complying with ASTM A325.

I. Install high strength steel bolts at locations indicated. Assembly and installation shall be in accordance with CBC requirements.

J. Erect structural steel plumb and level and to proper tolerances as set forth in the AISC Manual. Provide temporary bracing, supports or connections required for complete safety of structure until final permanent connections are installed.

K. Steel Columns: Set column bases in exact position for alignment, plumb and straight, supported on adjustable bolt supports or shims until grout has set. Set center of base true to column center within 1/16" and adjust column height exactly. Maintain bases at exact position and level during grouting. Fill grout space solid with non-shrink grout.

L. Damaged Members: During erection, straighten or replace members which are bent, twisted, or damaged as directed. If heating is required, perform heating by methods that ensure a uniform temperature throughout the entire member. When directed, remove members damaged to an extent impairing appearance, strength, or serviceability and replace with new members at no extra cost to the Owner.

3.3 FINISHING

A. After erection, spots or surfaces where paint has been removed, damaged, or burned off and field rivets, bolts, and other field connections not concealed in the Work, shall be cleaned of dirt, oil, grease, and burned paint and furnished with a spot coat of the same primer installed during shop priming.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Install paint to exposed areas with the same material installed during shop painting. Install by brush or spray to provide a minimum dry film thickness of 1.5 mils.

3.4 FIELD QUALITY CONTROL

A. Owner will provide a special inspector and independent testing laboratory to perform field inspections and tests and to prepare test reports.

B. All welders shall be qualified for each process and position per the latest edition of AWS D1.1, Chapter 4, Part C - Performance Qualifications. The welder's qualification shall be considered as remaining in effect indefinitely unless the welder is not engaged in a given process of welding for which the welder is qualified for a period exceeding six months or unless there is some specific reason to question a welder's ability.

C. Inspection of Shop Fabrication: Required for structural steel according to CBC Section 1704A.3.2.1.

D. Inspection of Shop and Field Welding: Required for all structural steel according to CBC Section 1704A.3.1.1.

E. Inspection of High Strength Bolt Installation: Required for both shop and field installation according to CBC Section 1704A.3.3 and 2212A.2.

F. Erection Inspection: Inspector shall inspect all erection including the grouting under base plates.

G. Non-Destructive Welding Inspection: The Special Inspector(s) shall continuously inspect and test all welds by ultrasonic or other non-destructive tests as approved. Test procedure for ultrasonic tests shall conform to AWS D1.1 and requirements herein.

1. Required Testing: Test following welds by ultrasonic testing method:

   a. Full Penetration Groove welded connections of column to column, column to girder, girder to girder, and like connections.

   b. Other welded connections indicated to be ultrasonically tested on Structural Drawings.

   c. Other welds directed to be ultrasonically tested by the Architect, Structural Engineer, or Inspector Of Record.

2. Ultrasonic Testing: An AWS Certified Welding Inspector, approved by DSA shall operate ultrasonic testing equipment, examine welds, and maintain a record of welds examined, defects found, and disposition of each defect. Defective welds shall be repaired in accordance with AWS D1.1, latest revision, and costs for retesting defective welds shall be responsibility of the Contractor. Tests shall be complete tests according to AWS D1.1, latest revision.

3. Rate of Testing: Test welds requiring ultrasonic testing at 100 percent. No reduction in testing rate will be permitted.

4. Backing Strips: Remove backing strips whenever ultrasonic indications arising from weld roots can be interpreted as either a weld defect or a backing strip, and retest weld if no root defect is visible. If no defect is disclosed by retest and no significant amount of the

base and weld metal is removed, joint needs no further repair or welding. Repair all defects disclosed. Contractor shall bear the cost of removals and repairs.

5. Ultrasonic Instrumentation: Calibrated by technician to evaluate the quality of welds in accordance with AWS D1.1-06, Sections 5 and 6.

6. Acceptance Criteria: In accordance with larger reflector criteria of AWS D1.1, latest revision.

H. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.

3.5 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.6 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 05580
PREFORMED METAL COLUMN COVERS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Principal work in this Section:

1. Custom preformed, prefinished metal column covers.

2. Supplementary parts and components such as inserts, clips, fasteners, anchors, bracing, and other miscellaneous supports and accessories required for a complete installation.

B. Related work:

1. Division 5 for metal fabrications.

1.2 SUBMITTALS

A. Submit large scale, dimensioned shop drawings including plans, elevations and detail sections. Indicate jointing, fasteners, anchorage, and accessory items, and indicate specified finishes.

1.3 QUALITY ASSURANCE

A. Manufacturer's qualifications: Firm which employs skilled persons and which has successfully fabricated products similar to those required for this Project and which has sufficient capacity to produce required units without causing delay in the Work.

B. Coordination: Coordinate fabrication and installation of items specified in this section with other, adjoining units of Work.

1.4 HANDLING

A. Deliver sheet metal fabrications as factory assembled units with protective crating and covering.

B. Store products on elevated platforms in a dry location.

1.5 PROJECT CONDITIONS

A. Verify size, location, and placement of sheet metal fabrications with adjoining construction prior to fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Column covers:

1. Interior aluminum columns: Model CC100 by Moz, UnaClad Series 200 UnaFab Column by Firestone Metal Products or equal by Pittcon Industries, Inc., CL Laurence, or Construction Specialties.

2. Exterior steel columns: UnaClad Series 100 UnaFab Column by Firestone Metal Products or equal by Pittcon Industries, Inc., CL Laurence or Construction Specialties.

2.2 MATERIALS

A. Provide sheet metals selected for their surface flatness, smoothness and freedom from surface blemishes where exposed to view in the finished unit. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, variations in flatness exceeding those permitted by referenced standards for stretcher-leveled metal sheet, stains, discoloration or other imperfections.

1. Sheet aluminum: 0.090 in. thick minimum aluminum, alloy 5005.

2. Sheet steel: 14 minimum gage, commercial quality cold-rolled carbon steel sheet, stretcher leveled.

B. Support structure: Consisting of full height extruded aluminum post, mounting brackets to floor and structure above, and post reinforcement brackets.

C. Trim:

1. Base reveal: As shown on the Drawings.

2. Column collar:

a. Exterior: Prefitted, latex primer finished column collar for drywall with 1/2 in. x 1/2 in. reveal; model PDCR-5050.

b. Interior: None.

D. Miscellaneous materials:

1. Fasteners: Of same basic metal and alloy as fastened metal, unless otherwise indicated. Do not use metals which are corrosive or incompatible with metals joined.

a. Provide concealed fasteners for interconnection of sheet metal fabrications and for their attachment to other work. Exposed fasteners are not acceptable.

2. Anchors and inserts: Of type, size, and material required for type of loading and installation indicated, as recommended by manufacturer, unless otherwise indicated. Use nonferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance.

a. Drilled-in expansion anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion (non-drilling), Type 1 (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.

3. Paint:

a. Exposed surfaces:

1) Aluminum column covers: Clear anodized as specified in Section 05080 with Kelp pattern, and Tuffcoat finish.

2) Steel column covers: Fluorocarbon resin coating as specified in Section 05082, Silversmith (Mica) 439RZ1541M Fluropon Classic II Coating by Valspar.

b. Shop primer for ferrous metal: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer compatible with finish paint systems specified in Section 09900.

c. Bituminous paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

4. Sound deadening compound: One of the following.

a. Heavy-bodied resinous coating, filled with granulated cork or other resilient material, compounded for permanent, non-flaking adhesion to metal in 1/8 in. thickness.

b. 3M's coating EC-1000.

c. Kinetics Type KDC-E-162 damping compound.

d. Presstite's No. 105A, or Vibradamp Corp's. No. 111.

2.3 FABRICATION, GENERAL

A. Fabricate column covers to comply with requirements indicated for design, dimensions, materials, joinery, and performance. Fabricate column cover in halves with flush hairline vertical joints and no horizontal joints.

B. Coordinate dimensions and attachment methods of column covers with those of adjoining products and construction to produce integrated assemblies with closely fitting joints, and edges and surfaces aligned with one another in relationship indicated.

C. Increase metal thickness or reinforce metal with concealed stiffeners or backing materials or both as required to produce surfaces whose variations in flatness exceed those permitted by referenced standards for stretcher-leveled metal sheet and to impart sufficient strength for use indicated.

D. Form column covers to profiles indicated in maximum lengths to minimize joints and without exposed cut edges.

E. Form column covers in 2 sections, with 1 in. wide open reveals.

F. Interior column at Planetarium shall have 2 horizontal reveals due to their height. Refer to Drawings for their dimensions and locations.

G. Build-in straps, plates and brackets as required for support and anchorage of fabricated items to adjoining construction.

H. Coat inside of column cover with sound deadening compound specified.

2.4 FINISH

A. Shop prime paint all surfaces after fabrication.

B. Protect finish on exposed surfaces from damage by application of adhesive paper or other temporary protective covering, prior to shipment.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for the installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors to be embedded in concrete construction. Coordinate delivery of such items to the project site.

3.2 INSTALLATION

A. Locate and place column covers plumb, level and in alignment with adjacent construction.

B. Use only concealed anchorages.

C. Form tight joints with exposed connections accurately fitted together.

D. Protect metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete or dissimilar metals.

3.3 FIELD QUALITY CONTROL

A. Repair finishes damaged during installation and construction period so that no evidence remains of correction work.

B. Return items which cannot be refinished in the field to the factory; make required alterations and refinish entire unit, or provide new units as required.

3.4 PROTECTION

A. Protect finishes from damage during construction period. Remove temporary protective coverings at time of finish painting.

END OF SECTION

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SECTION 06655
RESIN PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Solid resin panels for countertops and edges.

B. Related work:

1. Division 6 for architectural casework.

2. Division 6 for solid polymer and quartz coutertops.

1.2 SUBMITTALS

A. Shop drawings: Submit the following.

1. Indicate materials, fabrication details, field jointing, adjacent construction and methods of support and anchorages.

B. Data: Submit manufacturer’s data on specified products.

C. Samples: Submit 6-inch square samples representative of each color, texture and finish to be expected for final product.

D. Manufacturer's certificate: Submit certification that product meet or exceed specified requirements for stain resistance.

1.3 QUALITY ASSURANCE

A. Manufacturer's qualifications: Firm specializing in manufacturing the products specified in this Section with minimum 3 years documented successful experience.

B. Flammability: Materials shall pass the following.

1. Smoke density rating: ASTM D 2843

2. Combustion rating: ASTM D 635 for CC2.

3. Self-Ignition temperature: ASTM D 1929

C. Allowable Tolerances:

1. Maximum deflection: 1/16 in. over 12 in.

D. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects.

1. Build mockup of typical resin panel fabrication.

2. Approved mockups may remain a portion of the Work.

1.4 HANDLING

A. Storage: Indoors, properly supported and off the floor.

B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent damage or staining following installation for duration of project.

C. Before installing solid polymer fabrications, permit them to reach room temperature.

1.5 MAINTENANCE

A. Furnish list of approved cleaning materials and procedure required and provide list of substances that are harmful to product. Include instructions for stain removal, surface and gloss restoration and scratch removal.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Panels:

1. 3-Form, Inc. or equal (no known equal).

a. PNL-2: 1 in. thick, Chroma EcoResin resin sheets (polyester resin, glycol modified with UV inhibitor), Mai Tai, Infused, with polished edges.

2. Lumicor, Inc. or equal (no known equal).

a. SPF-1: 1 in. thick, Lumiguard (cross-linked acrylic), Honeycomb AM-831-101-AH, with sandstone finish.

b. SPF-2: 1 in. thick, Lumiguard (cross-linked acrylic), Teal Ice AC-824-402-TT with sandstone finish.

3. Knoll Textiles or equal (no known equal).

a. SPF-3: 1/2 in. thick, Imago PETG (polyethelene terephthalate glycol-modified) sheets, ~~Ozone Celestial IMOZON 02~~ Lintel Lithograph IMlint 03.

B. Cleaner: Type recommended by manufacturer.

C. Fasteners: Use screws designed specifically for plastics. Self-threading screws are acceptable for permanent installations. Provide threaded metal inserts for applications requiring frequent disassembly such as light fixtures.

D. Bonding Cements: Solvent or adhesives, suitable for use with product and application.

2.2 FABRICATION

A. Fabricate components to profiles and dimensions indicated and to comply with indicated standards. Sizes, profiles and other characteristics are indicated on the drawings.

B. Comply with manufacturer's written recommendations for fabrication.

C. Laminate to substrates indicated using adhesives and techniques recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION/PREPARATION

A. Examine conditions and measurements affecting the work of this Section at site.

B. Provide anchoring devices for installation. Provide templates and rough-in measurements.

C. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 INSTALLATION

A. Install components in compliance with the approved shop drawings.

B. Utilize fasteners, adhesives and bonding agents recommended by manufacturer for type of installation indicated. Material that is chipped, warped, hazed or discolored as a result of installation or fabrication methods will be rejected.

C. Anchor securely to supports with a maximum variation from true dimension and position of 1/8 inch.

3.3 CLEANING/PROTECTING

A. Clean and polish fabrications in compliance with manufacturer's instructions.

END OF SECTION

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SECTION 07810
SPRAYED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Sprayed cementitious fireproofing on all structural steel beams, columns and their connections, and steel deck between grid lines 1 to 3 and A to C, unless otherwise indicated.

B. Related work:

1. Division 7 for firesafing/firestopping.

1.2 SUBMITTALS

A. Data: Submit the following.

1. Manufacturer's data for the proposed fireproofing material together with proof of acceptance by regulatory agencies.

2. Table showing thickness, density and UL design number to be used for each condition, including W/D ratio for beams and columns; submit test reports used in this table which are not included in the UL Fire Resistance Directory.

B. Test reports: Submit the following from a qualified independent testing agency employed and paid by Contractor or manufacturer, except for field density.

1. Reports indicating that physical properties of proposed fireproofing products comply with specified requirements based on comprehensive testing of current product formulations.

C. Certificate: Submit the following.

1. Product certificate from fireproofing manufacturers that proposed fireproofing product complies with specified requirements including those for fire-test response characteristics and compatibility with adhesives, where applicable, and other surface coatings on substrates indicated to be fireproofed.

2. Certify the fireproofed areas, application thickness, UL design number, and UL rating.

3. Certify that cured material will not flake, peel, spall, soften, delaminate, or produce larger than hairline cracks.

1.3 QUALITY ASSURANCE

A. Requirements of regulatory agencies:

1. Provide materials and application procedures that have been tested and listed by UL, and are acceptable to authorities having jurisdiction for the assemblies shown.

2. Provide fireproofing complying with the requirements of authorities having jurisdiction for the fire resistance ratings and thicknesses indicated.

B. Applicator's qualifications: Experienced firm, certified, licensed, or otherwise qualified by the fireproofing manufacturer as having the necessary experience, staff, and training to install manufacturer's products as specified.

C. Asbestos: Provide fireproofing products containing no detectable asbestos as determined according to the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

1.4 HANDLING

A. Delivery: In packages bearing the UL label listing the design numbers for which they qualify.

B. Storage:

1. Inside, under cover, above ground, so they are kept dry until ready for use.

2. Use materials with limited shelf life within period indicated. Remove from Project site and discard materials whose shelf life has expired.

3. Remove from Project site and discard materials that have deteriorated.

1.5 JOB CONDITIONS

A. Comply with the fireproofing manufacturer's recommendations for ambient temperature requirements before, during and after the installation of the fireproofing.

B. Do not apply fireproofing on frost-covered surfaces.

C. In confined areas, provide natural or mechanical ventilation to properly dry this work during and after its application.

1.6 SEQUENCING

A. Sequence and coordinate application of fireproofing with related work to comply with the following:

B. Provide temporary enclosures to prevent deterioration of fireproofing exposed to unfavorable environmental conditions.

C. Avoid unnecessary exposure of fireproofing to abrasion and other damage during construction operations after its application.

D. Do not apply fireproofing on steel deck until completion of the concrete work thereon.

1. Do not apply fireproofing to the underside of roof deck until roofing membrane is watertight and roof top equipment has been installed; limit roof traffic during and for 30 days after application and drying of fireproofing to a minimum.

E. Do not begin application of fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.

F. Defer installing ducts, piping, and other items that would interfere with the application of fireproofing until fireproofing is completed.

G. Do not install enclosing or concealing construction until after fireproofing is applied, inspected, tested, and corrections are made to defective fireproofing.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fireproofing:

1. One of the following factory-mixed cementitious fireproofing, complying with these Specifications, and specifically manufactured and tested for fireproofing of steel members:

   a. Carboline Co., Fireproofing Products Div. Pyrolite 15.

   b. Isolatek International Cafco 300.

   c. WR Grace Monokote Type MK-6/HY (basis of design).

2. Material selected must fit within the space allocated on the Drawings, provide the fire resistance required and have the following characteristics. Unless otherwise specified, values specified are minimum acceptable

   a. Standard fire test method, ASTM E 119 (UL 263): UL tested or tested by another laboratory acceptable by Regulatory Agencies.

   b. Surface burning characteristics, ASTM E 84: Flame spread 0; smoke developed 0.

   c. Dry density, ASTM E 605: 15 pcf average with minimum individual samples not less than 14 pcf.

   d. Bond strength, ASTM E 736: 200 psf minimum.

   e. Deflection, ASTM E 759: No cracks, spalls or delamination.

   f. Bond impact, ASTM E 760: No cracks or delamination on bond impact.

   g. Compressive strength, ASTM E 761: 1,200 psf with no deformation exceeding 10 percent.

   h. Air erosion, ASTM E 859: 0.000 g/square foot in 24 hours. Sample shall not be purged before testing.

   i. Corrosion resistance, ASTM E 937: Does not promote corrosion of steel as tested.

   j. Indentation hardness ASTM C 569: 0.15-inch maximum.

B. Water: Potable, fresh, free of deleterious substances.

2.2 MIXING

A. Mix fireproofing in accordance with its manufacturer's instructions in clean machine(s) free of particles from previously mixed batches.

B. Mix water in calibrated equipment. Use mechanical mixing equipment, except that hand-mixing may be used for small applications covering less than one square foot of area.

C. Do not use caked and lumpy materials, nor materials that have partially set.

PART 3 - EXECUTION

3.1 EXAMINATION/PREPARATION

A. Examine surfaces to be fireproofed.

B. Clean steel of foreign matter, including loose mill scales, which would prevent the proper adhesion of the fireproofing to the substrate.

C. Do not apply fireproofing if substrate temperature is less then 40-degree F.

D. Correct conditions that would prevent proper and timely completion of this work before proceeding with installation.

3.2 PROTECTION

A. Protect surfaces not to be fireproofed from being damaged by the application, overspray, fallout and dusting-off of fireproofing material.

B. Provide temporary enclosures, as required, to confine operations and insure adequate ambient conditions.

C. Remove excess and spillage promptly.

D. Surfaces not scheduled to be fireproofed shall be free of fireproofing residue.

3.3 APPLICATION

A. Comply with the fireproofing manufacturer's instructions and recommendations for mixing, handling and machine application of fireproofing.

B. On steel deck, apply a spatter coat of fireproofing before applying fireproofing.

C. Apply fireproofing full thickness over required substrates as required to obtain the required fire resistance.

1. Spray material completely into inverted corners.

2. On roof decks, apply a discontinuous textured spray (ER Grace SpatterKote Type SK-3) before applying fireproofing.

3. Cover substrates in a monolithic blanket of uniform density, texture and thickness necessary to achieve the required fire protection.

4. Troweling of the finish material is not required.

D. Where indicated fill space between top of partitions and steel deck completely with fireproofing.

3.4 CLEANING

A. Upon completion of each floor or area, promptly remove fireproofing from surfaces not scheduled to receive it to leave these surfaces free of fireproofing material residue.

3.5 FIELD QUALITY CONTROL

A. Tests and inspections: As this work progresses, the Owner's Testing Laboratory will take measurements and verify the thickness, density and adhesion of the material in place for compliance with Specification requirements, in compliance with applicable UBC standard 7.6, ASTM E 605 and ASTM E 736, as required by authorities having jurisdiction.

B. Corrective work:

1. Apply additional fireproofing materials or replace defective materials where tests indicate non-compliance with the Contract Documents.

2. Evaluate values resulting from tests based on fireproofing manufacturer's published data in recognized tests.

3. After all attachments to fireproofed surfaces are made and just before enclosing the fireproofing, or before Substantial Completion for fireproofing to remain exposed in the building, inspect the fireproofing and patch damaged areas to maintain the integrity of the fireproofing.

END OF SECTION

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SECTION 08385
ACOUSTICAL DOOR ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Steel acoustical door assemblies including doors, frames, seals and neoprene door bottoms.

2. Supplementary parts and components, such as inserts, clips, fasteners, anchors, and other miscellaneous supports and accessories required for a complete installation.

B. Work installed but furnished in other Sections:

1. Finish hardware, other than thresholds, not specified herein: Section 08710.

C. Related work:

1. Finish painting this work: Section 09900.

D. Hollow metal door assemblies not required to be acoustically-rated: Section 08110.

1.2 SUBMITTALS

A. Shop drawings: Submit large scale shop drawings clearly showing the following.

1. Door schedule indicating opening identification symbol, door and frame types, sizes, thickness, swing, label requirements, and gaskets.

2. Elevation of each type of door and frame, materials, construction, finish, anchoring for each wall condition, conditions of openings, and accessories.

3. Location and size of reinforcement for finish hardware.

4. Head and jamb seals, door bottom construction, astragals.

5. Identify work that cannot be permanently factory-assembled before shipment.

6. Use same reference numbers for openings and details as Contract Drawings.

7. Coordinate shop drawings with the work of other trades which will be attached to, or on which this work depends for support. The work to be performed by other trades shall be noted, including adjacent and abutting materials to which this work will be secured.

B. Samples: Submit the following shop primed samples of this work.

1. 24 in. square sample of door showing typical head, bottom and jamb conditions, cut-outs for hinge, lock/latch and gaskets.

2. Frame corner condition with legs not less than 24 in. long showing typical corner reinforcement, finish and construction, and hinge, lock/latch and closer reinforcement.

3. Full size sample of each frame and door type. These samples will be viewed by the Architect at the job site. If approved and properly identified these samples may be incorporated in the Work.

C. Acoustical test reports: Submit test reports, from an independent acoustical testing laboratory, that the STC rating of doors proposed for use will comply with that specified when conducted by an independent acoustical testing laboratory accredited by the US Department of Commerce in compliance with ASTM E 90 and E 413 as specified.

D. Manufacturer's data: Submit manufacturer literature describing/illustrating the construction of doors and frames. Include data for shop primer and instructions for adjusting sound seals.

1.3 QUALITY ASSURANCE

A. Fire resistance: Where scheduled provide fire-rated door and frame assemblies bearing the label of a testing agency acceptable to the Fire Marshal for the fire resistance indicated.

B. Uniformity: All door and frame components specified herein shall be the product of the same manufacturer.

C. The acoustical door assemblies shall meet or exceed STC 61.

D. Supervision by door manufacturer:

1. As required during installation of the frames and hanging doors.

2. Manufacturer shall be present during final adjustment of sound seals to assure required installed field results.

E. Field testing:

1. Doors may be selected randomly for field verification testing of the acoustical performance, per ASTM E 336-84.

2. If an assembly does not pass the field test after adjustment, take necessary steps to obtain the required rating at no cost to the District, including replacement of assemblies if required. Further, the manufacturer must maintain representation until final project acceptance.

1.4 HANDLING

A. Packing: Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Box seals to prevent damage.

B. Delivery:

1. Inspect doors, frames, and accessories delivered to the site for damage. Unload and store, as specified, with a minimum of handling.

2. During delivery, provide temporary steel spreaders securely fastened to the bottom of each frame.

3. Replace doors and frames damaged before installation. Do not install damaged doors and frames.

C. Storage:

1. Store doors and frames carefully on platforms under cover. Provide a 1/4 in. space between stacked doors.

2. The storage spaces shall be dry and accessible, adequately ventilated and free from dust or water, and shall permit easy access for inspection and handling.

3. Do not use non-vented plastic or canvas shelters that create a humidity chamber.

4. If the fiberboard wrapper on the door becomes wet, remove it immediately.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Model DS6-61L by Protective Door Industries or equal by Overly Door Co., Krieger Steel Products Co. or other manufacturer specialized in the manufacture of metal sound-retardant door assemblies for at least 10 years, and acceptable to the Architect.

2.2 MATERIALS

A. Steel sheets and strip: As recommended by SDI 100.

B. Inserts, bolts and fasteners: Manufacturer's standard units.

C. Door core: Manufacturer standard.

D. Shop primer: Manufacturer standard rust-inhibitive shop paint, compatible with finish paint specified in Section 09900.

E. Door seals: Manufacturer durable, standard magnetic stops in adjustable retainers, and mortise automatic threshold.

2.3 FABRICATION

A. General: The applicable provisions of the following SDI standards govern the work of this Section.

1. SDI 100, Recommended Specifications for Standard Steel Doors and Frames.

2. SDI 105, Recommended Erection Instructions for Steel Frames.

3. SDI 107, Hardware on Steel Doors (Reinforcement Application.

4. SDI 112, Recommended Standard Minimum Acceptance Values for Steel Doors and Frames.

B. Fabricate this work to the profiles and dimensions indicated by roll-forming, brake-forming and welding to produce metal doors and frames with straight and square edges.

1. Doors: Minimum 14 gage sheet steel face sheets.

2. Frames: Structural steel.

C. Fit and fabricate this work with surfaces free from warp, wave, buckle, oil canning or other defects.

D. Welding shall conform to AWS standards. Grind exposed welds flush and smooth with parent metal.

E. Preparation for finish hardware:

1. Reinforce the doors and frames for finish hardware in compliance with SDI 100, Table IV, and locate finish hardware in compliance with Table V of this publication.

2. Cut, drill and tap the doors and frames to receive finish hardware in compliance with the hardware manufacturer's instructions and templates. Drill and tap doors in the field to receive surface-applied hardware. Provide reinforcement for closers on all doors and frames.

F. Finishing:

1. After assembly, clean, treat, and paint exposed surfaces of steel door and frames.

2. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

3. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

4. Finish painting is specified in Section 09900.

PART 3 - EXECUTION

3.1 INSPECTION

A. Level subfloor and thresholds so that they contact a straightedge for the length of the threshold.

B. Inspect adjacent construction and supports.

C. Make sure that openings are within allowable tolerances, plumb, level, clean, will provide a solid anchoring surface and conditions detrimental to the proper or timely completion of this work are corrected before proceeding with installation.

3.2 INSTALLING FRAMES

A. Install frames plumb, square and straight, in compliance with the Drawings, these Specifications, the approved shop drawings and UL tested procedures for fire-rated openings.

1. Provide a minimum of 3 anchors per jamb for frame with doors under 81 in. high; provide one additional anchor for doors in frame over 81 in.

2. Attach jamb anchors securely to studs.

B. Brace the frames to prevent their displacement during erection of adjacent walls, and coordinate the installation of built-in anchors with related trades.

C. Provide UL approved adjustable floor clips for all frames and anchor them securely to concrete slabs with powder driven pins or bolts in expansion shields.

D. Grout frames solidly with sand/cement/lightweight aggregates mix, eliminating voids by slushing and rodding mortar, or pre-grout frames before installation.

3.3 INSTALLING FINISH HARDWARE/HANGING DOORS

A. Install finish hardware in compliance with the hardware manufacturer's templates and printed instructions.

B. Adjust operable parts for correct function so the doors operate freely, without sticking or binding, but so that seals are in contact with frame and floors for their entire length when the door is closed.

C. Install doors in their frames and adjust them to meet the STC specified when closed. Do not install doors that are warped, bowed, dented or otherwise damaged.

3.4 FIELD QUALITY CONTROL

A. Pay such costs as are required, and secure a visit to the job site by a qualified representative of the manufacturer of the acoustical door assemblies, who shall:

1. Inspect the completed installation.

2. Put all components of the work of this Section through at least 10 complete cycles of operation, verifying that each component is properly installed and properly operating, and making required adjustments to achieve optimum operation.

3. Using a mechanic's stethoscope and providing an appropriate cassette noise tape, direct the efforts of the Contractor in adjusting sound seals for optimum efficiency and correcting improper installation of the work of this Section.

4. State in a signed letter to the Architect that the work of this Section has been installed in compliance with the approved shop drawings.

B. Clean damaged primer, sand smooth, reclean and spot prime with a paint compatible with the primer and the scheduled finish coats.

END OF SECTION

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SECTION 08600
ALUMINUM-FRAMED SKYLIGHTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Skylight framing and glazing.

2. Flashings at perimeter of skylight.

3. Closure pieces, clips and angles.

4. Gaskets and sealants for the work of this Section.

5. Supplementary parts and components, such as inserts, clips, fasteners, anchors and other miscellaneous supports required for a complete, weatherproof installation.

B. Related work:

1. Division 7 for flashings other than for skylight.

2. Division 7 for sealants other than specified herein.

3. Division 8 for all other glass and glazing.

1.2 REFERENCES

A. AA, Specifications for Aluminum Structures.

B. AA, Aluminum Standards and Data.

C. AISC, Steel Construction Manual.

D. AISI, Cold-Formed Steel Design Manual.

E. AWS D1.1, Structural Welding Code.

1.3 PERFORMANCE CRITERIA

A. Intent:

1. Drawings are schematic and do not imply to identify or solve the issues of thermal or structural movements, anchorage, flatness and stability of facing, or moisture disposal in the assembly.

2. Drawings do not imply to solve issues in the glass line associated with glass movement, pressure fracture, or thermal shock.

3. Drawings contain details that suggest possible solutions for solving some of the major design requirements. Contractor may use the intent of these details and develop them as Contractor deems best.

4. Specifications are of the performance type and include the minimum requirements of the skylight system without limiting the Contractor to methods of achieving such performance.

5. Unless otherwise defined by Contract Documents, the appearance of exposed elements, including width and depth shall be within dimensional limits indicated (section profiles) and be consistent throughout the Project.

6. Unless otherwise defined by Contract Documents, the overall thickness of each glass type, and the component thickness of each multiple layer glass type shall be consistent throughout the Project.

B. General: Provide skylight capable of withstanding loads and thermal and structural movements indicated without failure. Failure includes the following.

1. Deflection exceeding specified limits.

2. Thermal stresses transferred to the supporting structure.

3. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing.

4. Noise or vibration created by thermal and structural movement and wind.

5. Loosening or weakening of fasteners, attachments, and other components.

6. Sealant failure.

C. Structural sealant glazing:

1. Structural silicone sealant does not carry gravity load of glazing.

2. Tensile and shear stress in structural silicone sealant joints is less than 20 psi.

3. Structural silicone sealant joints accommodate thermal and mechanical movement, prevent glazing-to-glazing contact, and maintain required glazing-edge clearances.

4. Structural silicone sealant fails cohesively before sealant releases from substrate when tested for adhesive compatibility with each substrate and joint condition required.

a. Adhesive failure occurs when sealant pulls away from a substrate cleanly, leaving no sealant material behind.

b. Cohesive failure occurs when sealant breaks or tears within a joint but does not separate from each substrate because sealant-to-substrate bond strength exceeds sealant's internal strength.

D. Deflection limits:

1. Deflection of the entire length of framing members in direction normal to glazing plane is limited to 1/180 of clear span or 3/4 inch, whichever is smaller, unless otherwise indicated.

2. Deflection of the entire length of framing members for spans exceeding 20 feet is limited to 1/240 of clear span.

3. Deflection of framing members in a direction parallel to glazing plane, when carrying full dead load, is limited to an amount not exceeding that which reduces glazing bite below 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

E. Lateral support: Compression flanges of flexural members are laterally braced by cross members with minimum depths equal to 50 percent of flexural member depth and by anchors to the building structure. Glazing material does not provide lateral support.

F. Structural loads: Provide skylight, including anchorage, capable of withstanding the effects of the following design loads when supporting full dead loads:

1. Wind loads: Per CBC.

2. Roof loads: As follows:

a. Concentrated load: 250 lbf applied to framing members at location that produces the most severe stress or deflection.

b. Live load: Per CBC.

c. Rain load: Per CBC.

3. Seismic loads: Per CBC.

G. Structural performance: Provide skylight, including anchorage, capable of withstanding test pressure indicated without material and deflection failures and permanent deformation of structural members exceeding 0.2 percent of span when tested according to ASTM E 330.

1. Test pressure: 150 percent of positive and negative wind-load design pressures.

2. Test duration: As required by design wind velocity; fastest 1 mile of wind for relevant exposure category.

H. Thermal movement:

1. Provide skylight that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, sealant failure, and other detrimental effects.

2. Temperature change (range): 120-degree F, ambient; 180-degree F material surfaces.

I. Air infiltration: Provide skylight with maximum air leakage of 0.06 cfm/square foot of surface when tested according to ASTM E 283 at a minimum static-air-pressure differential of 6.24 psf.

J. Water penetration: Provide skylight that do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 6.24 psf.

1.4 SUBMITTALS

A. Data: List of manufactured and fabricated products and components that will be used in the skylight assembly.

B. Shop drawings:

1. Large scale, dimensioned shop and erection drawings for skylight.

2. Show joinery techniques, provision for horizontal and vertical expansion, glass and metal thicknesses, and framing member profiles. Identify all materials including metal alloys, glass types, fasteners, and glazing materials.

3. Identify shop and field sealants by product name and locate on shop drawings. Show relative layout of adjacent beams, columns, and slabs, correctly dimensioned.

4. Show interface with adjacent and abutting materials.

5. Dimension position of glass edge relative to metal daylight.

6. Identify shop and field welds by AWS Welding Symbols, A2.0.

C. Samples:

1. 12-inch samples of production-run aluminum extrusions with the specified finish, and a corner assembly showing typical skylight construction.

2. 12-inch long samples of gaskets.

D. Cutaway sample: Of framing intersection, made from 12 inch long lengths of full-size components and showing details of the following:

1. Primary members.

2. Joinery.

3. Anchorage.

4. Expansion provisions.

5. Glazing.

6. Flashing and drainage.

7. Structural-sealant joints.

E. Structural calculations: Prepare and submit structural calculations for the skylight.

1. Prepare calculations in compliance with current design rules of AA, AISC, AISI, and ACI. Include analysis for wind, seismic, live and dead loads on framing members, anchors, and concrete inserts.

2. Show section property computations for framing members.

3. Show vertical and horizontal loads on curbs and other supports.

4. Existing test reports will be acceptable substitute for calculations.

5. Calculations shall be signed and stamped by a California-licensed professional engineer.

6. Do not increase allowable stresses or decrease applied loads for design wind load, seismic load, or those loads in combination with other loads, where not permitted by Code, or if resultant allowable stress after increase is greater than or equal to yield stress.

F. Building Department approval: Submit reviewed shop drawings, calculations and any other supporting data required by the Building Department for its review and approval. Pay applicable fees resulting therefrom.

G. Preconstruction test reports: Indicate and interpret test results for compliance with requirements.

H. Product test reports: From a qualified testing agency indicating skylight comply with requirements, based on comprehensive testing of current products.

I. Sealant compatibility and adhesion test reports: From sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with sealants; include sealant manufacturer's interpretation of test results for sealant performance and recommendations for primers and substrate preparation needed for adhesion.

J. Field test reports: Indicate and interpret test results for compliance with requirements.

K. Closeout: Furnish the District a comprehensive plan for replacement of broken glass. Include a local source.

1.5 QUALITY ASSURANCE

A. Fabricator/installer’s qualifications: Single firm which can show a minimum of 5 years of successful experience in fabricating and erecting skylight similar to that required for this Project.

B. Engineering responsibility:

1. Engineer, fabricate, assemble and erect the skylight to meet or exceed the criteria specified, and to provide watertight, structurally sound, self-draining assembly conforming to governing codes and regulations.

2. Fasteners and connections are shown schematically. A California-licensed professional engineer employed by the Contractor shall determine final types and sizes.

a. In no case shall the fasteners or connections conflict with or require revision of the finish profiles of the skylight or the supporting work.

b. Connections to the structural frame shall not impose any eccentric loading, or induce twisting or warping.

c. Connections to the structural frame shall be able to accommodate actual and potential misalignment of the steel structure within limits allowed by the AISC tolerances.

C. Professional engineer qualifications:

1. Professional engineer legally qualified to practice in California and experienced in providing engineering services of the kind indicated.

2. Engineering services are defined as those performed for installations of skylights that are similar to those indicated for the Project in material, design, and extent.

D. Testing agency qualifications: Independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

E. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code - Aluminum".

1.6 HANDLING

A. Procedure: "Care and Handling of Architectural Aluminum from Shop to Site" published by AAMA.

1.7 WARRANTY

A. Warrant skylight against defective materials and workmanship for 5 years after Substantial Completion.

B. Written warranty, executed by manufacturer agreeing to repair or replace components of assemblies that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

1. Structural failure.

2. Sealant failure.

3. Failure of system to meet performance requirements.

4. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

5. Water leakage; defined as uncontrolled water appearing on normally exposed interior surfaces of skylight from sources other than condensation. Water controlled by flashing and gutters and drained back to the exterior and that cannot damage adjacent materials or finishes is not water leakage.

C. Repair or replace defective materials and workmanship during the warranty period at no cost to the District.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. One of the following:

1. Architectural Skylight Co.

2. Fisher Skylights, Inc.

3. Metcoe Skylight Specialties, Inc.

4. O'Keeffe's, Inc.

5. Super Sky Products, Inc.

2.2 MATERIALS

A. Framing members: Extruded aluminum alloy ASTM B 221, 6063-T5 or 6061-T6.

1. Extrusions: ASTM B 221.

2. Sheet and plate: ASTM B 209.

3. Bars, rods, and wire: ASTM B 211.

B. Concealed flashing: Stainless steel or other corrosion-resistant, non-staining, non-bleeding flashing; compatible with adjacent materials. Do not use galvanized steel.

C. Exposed flashing and closures: Aluminum sheet 0.060 inch thick.

D. Fasteners and accessories: Manufacturer's standard corrosion-resistant, nonstaining, non-bleeding fasteners and accessories; compatible with adjacent materials.

1. Movement joints: Provide slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.

2. Aluminum retaining cap fasteners: ASTM A 193, Series 300 stainless-steel screws; type as recommended by manufacturer.

3. Connections to Supporting Structure: ASTM A 307, zinc-coated steel fasteners.

4. Anchor bolts: ASTM A 307, Grade A, zinc-coated steel anchor bolts.

5. Concrete or masonry inserts: Zinc-coated cast-iron, malleable-iron, or steel inserts; hot-dip galvanized according to ASTM A 123.

E. Exterior caps: Extruded aluminum alloy 6063-T5. Minimum thickness 0.120 inch.

F. Aluminum flashings: Alloy and temper selected by the fabricator. Minimum thickness 20-gage.

G. Fasteners: Finish fasteners exposed to view to match aluminum framing systems.

1. Exposed to view: 302/304 series stainless steel.

2. Used for bolting aluminum extrusions and their connecting members: 2024-T4 aluminum or stainless steel.

3. Used for the attachment of the skylight to the supporting curbs: Cadmium-plated or hot-dip galvanized steel.

H. Welding electrodes: As recommended by AWS and the aluminum manufacturer for the conditions of use and the alloys being welded.

I. Glass and glazing materials: As specified in Section 08800.

J. Framing system gaskets and joint fillers: Manufacturer's standard permanent gaskets and joint fillers for sliding, compression, and nonmoving joints.

K. Paint:

1. For finish on exposed surfaces: As specified in Section 05082.

2. For concealed ferrous metal surfaces: Tneme-Zinc 90-93 by Tnemec, Zinc-Lock 308 by Porter International, or MZ-4 Epoxy Zinc-Rich Primer by Valspar Corp.

L. Bituminous coating: Cold-applied asphalt mastic compounded for application in a 30-mil coating.

M. Bituminous paint: Cold-applied asphalt mastic paint complying with SSPC-Paint 12, except containing no asbestos, and formulated for 30-mil thickness per coat.

N. Sealants and backer rods:

1. Within assembly: Manufacturer's standard non-drying, non-skinning sealant complying with AAMA 809.2.

2. Between assembly and adjacent materials: As specified in Section 07920.

2.3 GLAZING MATERIALS

A. Glass: As scheduled and specified in Section 08800.

B. Glazing gaskets:

1. Manufacturer's standard pressure-glazing gaskets of elastomer type and hardness selected by skylight and gasket manufacturers to comply with requirements.

2. Provide gasket assemblies with corners sealed with sealant recommended by gasket manufacturer.

C. Spacers, edge blocks, and setting blocks:

1. Manufacturer's standard permanent nonmigrating type of elastomer type and hardness selected to comply with requirements.

2. For structural silicone glazing, provide bond-breaking spacer gaskets and bonding setting blocks compatible with silicone sealants.

D. Structural silicone sealant: ASTM C 1184, compatible with components with which sealant comes in contact, formulated and tested for use as a structural sealant, and neutral curing.

1. Color: Black.

2. Tensile strength: 100 psi minimum.

3. Provide sealant with modulus of elasticity that will not allow movement of more than 25 percent of joint width, unless less movement is required by skylight system design.

2.4 FABRICATION

A. General:

1. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.

2. Fabricate components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.

3. Fabricate components to ensure that glazing is thermally and physically isolated from framing members.

4. Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.

5. Fit and secure joints with screw and spline, internal reinforcement, or welding.

6. Reinforce members to retain fastener threads.

7. Where fasteners are exposed to view from interior, countersink bolt or screw heads and finish to match framing.

8. Weld components before finishing and in concealed locations to greatest extent practicable to minimize distortion.

B. Maintain the visual design concepts shown, including member sizes, profiles and alignment of components.

C. Fabricate and assemble this work with proper and acceptable provision for noiseless thermal movements, fabrication and erection tolerances, adjoining building component tolerances and dynamic movements.

D. Removable members such as glass stops, fillers or closures shall be extruded, and securely engaged into adjacent components. Fabricate extrusions to eliminate edge projection, bowing, or misalignment at joints.

E. Design and construct moving joints so that they will be, and remain, permanently watertight, and will accommodate weather and building dynamics.

F. For surfaces exposed to view employ only materials which are free from alloy defects, die marks, scratches, streaks and other surface blemishes.

G. Complete the fabrication and assembly of the components in the shop to the greatest extent possible to minimize field cutting, splicing, fastening, sealing and finishing.

1. Maintain provisions for anticipated movement.

2. Disassemble only as necessary for shipment and erection.

3. Provide secure attachment and support at joints, with hairline, flush fit between contacting members.

H. Complete the cutting, fitting, forming, drilling and grinding of metal before cleaning and applying specified finish. Remove arrises from cut edges and ease edges and corners to a radius of approximately 1/64-inch minimum, 1/32-inch maximum.

I. Welding:

1. Comply with industry standards for assembly and fabrication using system and rods for exposed metals that will provide texture match with materials being joined.

2. Grind exposed welds smooth and flush with parent metal using clean grinding wheels of a type that will not result in stains or discoloration.

J. Finishing: Finish surfaces as follows to be within the color range represented by approved samples.

1. Finish aluminum surfaces exposed to view as specified in Section 05082.

2. Prime concealed aluminum surfaces in contact with masonry, concrete or steel with a compatible primer or bituminous paint.

3. Paint steel parts of anchors, anchor inserts, reinforcement and supports with primer specified. After field welding, remove weld slag and touchup primed surface with same primer.

4. Provide minimum DFT of 2 mils for primer and 30 mils for bituminous paint.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine adjacent construction and supports.

B. Verify that opening is within allowable tolerances, level, clean, will provide a solid anchoring surface, and that other conditions detrimental to the proper or timely completion of this work are corrected before proceeding with installation.

3.2 INSTALLATION

A. General:

1. Do not install defective components including warped, bowed, dented, abraded and broken members. Remove and replace members that have been damaged during installation or thereafter before the time of final acceptance.

2. Do not cut, trim, or weld components during erection, in any manner that would damage the finish, decrease the strength, or result in a visual imperfection or a failure in performance of the work.

3. Return components that require alteration to the shop for refabrication, if possible, or for replacement by new parts.

4. Install components level, plumb, true to line and with uniform joints and reveals. Secure to structure with non-staining and non-corrosive shims, anchors, fasteners, spacers and fillers.

B. Assembly and anchorage:

1. Anchor components securely in place by bolting, welding or other permanent mechanical attachment system, which will comply with performance requirements and permit movements intended or necessary.

2. Install slip-joint linings where required to ensure movement as intended or necessary.

3. Provide a tape separator between contact surfaces of dissimilar materials where there is a possibility of corrosive or electrolytic action.

4. Remove weld slag and apply primer over welds as specified above.

C. Erection tolerances:

1. Provide adjustment within the assembly to accommodate job variations.

2. Install the work of this Section within the following tolerances.

3. Variation from plane: Limit variation from plane or location shown to 1/8 inch in 10 feet; 1/4 inch over total length.

a. Alignment: Where surfaces abut in line and at corners and where surfaces are separated by less than 3 inches, limit offset from true alignment to less than 1/32-inch; otherwise, limit offset from true alignment to 1/8-inch.

b. Maximum offset between glass framing members at corners of glazing pocket must not exceed 1/32-inch.

D. Glazing: Glaze skylight as specified in Section 08800.

3.3 SEALANTS

A. Structural silicone sealant glazing:

1. Prepare surfaces that will contact sealant and install sealant according to sealant manufacturer's written instructions.

2. Preparation includes, but is not limited to, cleaning and priming.

3. Mechanically fasten glazing in place until sealant cures.

4. Clean excess sealant from surfaces before sealant cures.

B. Seal joints between skylight and adjacent construction to be weathertight.

C. Comply with the requirements of Section 07920.

3.4 FIELD QUALITY CONTROL

A. Tests:

1. Perform field water test in compliance with ASTM E 1105, on the completed skylight. Should such testing result in leakage, eliminate the causes of such leakage at no additional cost to the District.

2. Remedial measures must maintain standards of quality and durability and are subject to the Architect's approval.

3. Provide powered scaffold, hose and sufficient personnel to operate scaffold and hose.

4. Perform one test on each skylight assembly after completion, with repeat tests if failures occur.

B. Touchup: Touchup damaged finish as specified in Section 05082, when the results are satisfactory to the Architect, otherwise return the damaged component to the shop for refinishing.

END OF SECTION

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SECTION 08710
FINISH HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Door Hardware, including electric hardware.
2. Storefront and entrance door hardware.
3. Power supplies for electric hardware.
4. Wiring diagrams for electric hardware.

B. Related Sections:

1. Section 07920 - Joint Sealers – exterior thresholds
2. Section 08110 – Steel Doors and Frames
3. Section 08210 - Wood Doors
4. Section 08410 – Aluminum-Framed Storefronts And Entrances
5. Division 16 for electrical power
6. Section 16722 – Access Control System

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.

1. Windows.
2. Cabinets, including open wall shelving and locks.
3. Signs, except where scheduled.
4. Toilet accessories, including grab bars.
5. Installation.
6. Rough hardware.
7. Conduit, junction boxes & wiring.
8. Access doors and panels, except cylinders where detailed.
9. Corner Guards.

1.2 REFERENCES

A. American National Standards Institute – ANSI 156.18 – Materials and Finishes.

B. 2007 California Building Code.

C. ICC/ANSI A117.1 - 1998 – Specifications for making buildings and facilities usable by physically handicapped people.

D. ADA – Americans with Disabilities Act of 1990

E. BHMA – Builders Hardware Manufacturers Association

F. DHI – Door and Hardware Institute

G. NFPA – National Fire Protection Association

1. NFPA 80 – Fire Doors and Windows

2. NFPA 105 – Smoke and Draft Control Door Assemblies

3. NFPA 252 – Fire Tests of Door Assemblies

H. UL – Underwriters Laboratories

1. UL10C – Positive Pressure Fire Tests of Door Assemblies.

2. UL 305 – Panic Hardware

I. WHI – Warnock Hersey Incorporated

J. State of California Building Code

K. Local applicable codes

L. SDI – Steel Door Institute

M. WI – Woodwork Institute

N. AWI – Architectural Woodwork Institute

O. NAAMM – National Association of Architectural Metal Manufacturers

1.3 SUBMITTALS & SUBSTITUTIONS

A. SUBMITTALS: Submit six copies of schedule per Division 1. Only submittals printed one sided will be accepted and reviewed. Organize vertically formatted schedule into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:

1. Type, style, function, size, quantity and finish of hardware items.

2. Use BHMA Finish codes per ANSI A156.18.

3. Name, part number and manufacturer of each item.

4. Fastenings and other pertinent information.

5. Location of hardware set coordinated with floor plans and door schedule.

6. Explanation of abbreviations, symbols, and codes contained in schedule.

7. Mounting locations for hardware.

8. Door and frame sizes, materials and degrees of swing.

9. List of manufacturers used and their nearest representative with address and phone number.

10. Catalog cuts.

11. Wiring Diagrams.

12. Manufacturer's technical data and installation instructions for electronic hardware.

B. Bid and submit manufacturer's updated/improved item if scheduled item is discontinued.

C. Deviations: Highlight, encircle or otherwise identify deviations from "Schedule of Finish Hardware" on submittal with notations clearly designating those portions as deviating from this section.

D. If discrepancy between drawings and scheduled material in this section, bid the more expensive of the two choices, not the discrepancy in the submittal and request direction from Architect for resolution.

E. Substitutions per Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.

F. Items listed with no substitute manufacturers have been requested by Owner to meet existing standard.

G. Furnish as-built/as-installed schedule with closeout documents, including keying schedule, wiring diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

1.4 QUALITY ASSURANCE:

A. Qualifications:

1. Hardware supplier: direct factory contract supplier who employs a certified architectural hardware consultant (AHC), available at reasonable times during course of work for project hardware consultation to Owner, Architect and Contractor.

a. Responsible for detailing, scheduling and ordering of finish hardware. Detailing implies that the submitted schedule of hardware is correct and complete for the intended function and performance of the openings.

B. Hardware: Free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.

C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

D. Fire-Rated Openings: NFPA 80 compliant. Hardware UL10C / UBC Standard 7-2 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching

hardware, non-flaming door closers, approved-bearing hinges, and resilient seals. Coordinate with wood door section for required intumescent seals. Furnish openings complete.

E. Note: scheduled resilient seals may exceed selected door manufacturer's requirements.

F. See 2.6.E for added information regarding resilient and intumescent seals.

G. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers' instructions.

1.5 DELIVERY, STORAGE AND HANDLING

A. Delivery: coordinate delivery to appropriate locations (shop or field).

1. Permanent keys and cores: secured delivery direct to Owner's representative.

B. Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.

C. Storage: Provide securely locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, dust, excessive heat and cold, etc.

1.6 PROJECT CONDITIONS AND COORDINATION:

A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical the same operation and quality as type specified, subject to Architect's approval.

B. Coordination: Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents. Furnish related trades with the following information:

1. Location of embedded and attached items to concrete.

2. Location of wall-mounted hardware, including wall stops.

3. Location of finish floor materials and floor-mounted hardware.

4. Manufacturer templates to door and frame fabricators.

C. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

1.7 WARRANTY

A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' written warranties:

1. Locksets: Three years

2. Exit Devices: Three years mechanical, One year electrical

3. Closers: Ten years mechanical, Two years electrical

4. Other Hardware Two years

1.8 COMMISSIONING

A. Conduct these tests prior to request for certificate of substantial completion:

1. With installer present, test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.

2. With installer, access control contractor and electrical contractor present, test electrical, electronic and electro-pneumatic hardware systems for satisfactory operation.

3. With installer and electrical contractor present, test hardware interfaced with fire/life-safety system for proper operation and release.

1.9 REGULATORY REQUIREMENTS:

A. Locate latching hardware between ~~30"~~ 34" to 44" above the finished floor, per California Building Code, Section 1008.1.8.2 and ~~1133B.2.5.1~~ 1133B.2.5.2.

1. Locate panic hardware between 36" to 44" above the finished floor.

B. Handles, pull, latches, locks, other operating devices: readily openable from egress side without tight grasping, tight pinching, or twisting of the wrist to operate. California Building Code 1008.1.1.

~~B.~~C. Adjust doors to open with not more than 5.0 lbs pressure to open at exterior doors and 5.0 lbs at interior doors. As allowed per California Building Code, Section 1133B.2.5, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15 lbs.

~~C.~~D. Adjust door closer sweep periods so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door, per California Building Code Section 1133B.2.5.1

E. Smooth surfaces at bottom 10" of push sides of doors, facilitating push-open with wheelchair footrests, per California Building Code Section 1133B.2.6.

~~B.All hardware to meet California Building Code Sections 1133B.2.1, 1133B.2.5.1 and 1003.3.1.8.~~

~~C.Thresholds: Comply with California Building Code Section 1133B.2.4.1.~~

F. Door opening clear width no less than 32", measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30" and the hardware projects no more than 4". California Building Code Section 1133B.2.2, 1133B.2.3, and 1008.1.1.

G. Door opening clear height no less than 80" measured from top of sill to bottom of frame header stop. Projections into clear opening height not to exceed 4". California Building Code Section 1133B.2.2 and 1008.1.1.

H. Thresholds: floor or landing no more than 1/2" below the top of the threshold of the doorway. Change in level between 1/4" and 1/2": beveled to slope no greater than 1:2 (50 percent slope). California Building Code Section 1133B.2.4.1.

~~F.~~I. Floor stops: Do not locate in path of travel. Locate no more than 4" from walls, per DSA Policy #99-08 (Access).

J. Pairs of doors: limit swing of one leaf to 90 degrees to protect persons reading wall-mounted tactile signage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Listed acceptable alternate manufacturers: submit for review products with equivalent function and features of scheduled products.

ITEM:	MANUFACTURER:	ACCEPTABLE SUB:
Hinges	(IVE) Ives	Bommer
Continuous Hinges	(IVE) Ives	Select
Key System	(SCH) Schlage	Owner's Standard
Locks	(SCH) Schlage	Owner's Standard
Exit Devices	(VON) Von Duprin	Owner's Standard
Closers	(LCN) LCN	Owner's Standard
Auto Flush Bolts	(IVE) Ives	DCI
Coordinators	(IVE) Ives	DCI
Silencers	(IVE) Ives	Trimco
Push & Pull Plates	(IVE) Ives	Trimco
Kickplates	(IVE) Ives	Trimco
Stops & Holders	(IVE) Ives	Trimco
Overhead Stops	(GLY) Glynn-Johnson	None available
Thresholds	(PEM) Pemko	NGP
Seals & Bottoms	(PEM) Pemko	NGP

2.2 HINGING METHODS

A. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable. Use wide-throw conventional or continuous hinges as needed up to 8 inches in width to allow

door to stand parallel to wall for true 180-degree opening. Advise architect if 8-inch width is insufficient.

B. Conform to manufacturer's published hinge selection standard for door dimensions, weight and frequency, and to hinge selection as scheduled. Where manufacturer's standard exceeds the scheduled product, furnish the heavier of the two choices, notify Architect of deviation from scheduled hardware.

C. Conventional Hinges: Steel or stainless steel pins and concealed bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.

1. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins and security studs.

2. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.

D. Continuous Hinges:

1. Geared-type aluminum.

a. Use wide-throw units where needed for maximum degree of swing, advise architect if commonly available hinges are insufficient.

2.3 LOCKSETS AND LATCHSETS

A. Mortise Locksets and Latchsets: as scheduled.

1. Chassis: cold-rolled steel, handing field-changeable without disassembly.

2. Latchbolts: 3/4 inch throw stainless steel anti-friction type.

3. Lever Trim: through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable.

a. Spindles: security design independent breakaway. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.

4. Furnish solid cylinder collars with wave springs. Wall of collar to cover rim of mortise cylinder.

5. Electric operation: Manufacturer-installed continuous duty solenoid.

6. Strikes: 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing.

7. Scheduled Lock Series and Design: Schlage L series, 06A design.

8. Certifications:

a. ANSI A156.13, 1994, Grade 1 Operational, Grade 1 Security.

b. ANSI/ASTM F476-84 Grade 31 UL Listed.

2.4 EXIT DEVICES / PANIC HARDWARE

A. General features:

1. Independent lab-tested 1,000,000 cycles.

2. Push-through push-pad design. No exposed push-pad fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.

3. 0.75-inch throw deadlocking latchbolts.

4. End caps: impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.

5. No exposed screws to show through glass doors.

6. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.

7. Releasable in normal operation with 15-lb. maximum operating force per UBC Standard 10-4, and with 32 lb. maximum pressure under 250-lb. load to the door.

8. Exterior doors scheduled with XP-series devices: Static load force resistance of at least 2000 pounds.

9. Flush end cap design as opposed to typical "bottle-cap" design end cap.

10. Comply with CBC Section 1003.3.1.9.

B. Specific features:

1. Non-Fire Rated Devices: cylinder dogging.

2. Lever Trim: breakaway type, forged brass or bronze escutcheon min .130” thickness, compression spring drive, match lockset lever design.

3. Fire-Labeled Devices: UL label indicating “Fire Exit Hardware”. Vertical rod devices less bottom rod (LBR) unless otherwise scheduled.

4. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.

2.5 CLOSERS

A. Surface Closers:

1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.

2. ISO 2000 certified. Units stamped with date-of-manufacture code.

3. Independent lab-tested 10,000,000 cycles.

4. Non-sized and adjustable. Place closers inside building, stairs and rooms.

5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.

6. Advanced Variable Backcheck (AVB): where scheduled, these units commence backcheck at approximately 45 degrees.

7. Adjustable to open with not more than 5.0lbs pressure to open at exterior doors and 5.0lbs at interior doors. As allowed per California Building Code, Section 1133B.2.5, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15lbs.

8. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.

9. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units. EDA arms: rigid main and forearm, reinforced elbow.

10. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.

11. Exterior doors: seasonal adjustments not required for temperatiures form 120 degrees F to -30 degrees F, furnish checking fluid data on request.

12. Non-flaming fluid, will not fuel door or floor covering fires.

13. Pressure Relief Valves (PRV) not permitted.

2.6 OTHER HARDWARE

A. Automatic Flush Bolts: Low operating force design.

B. Overhead Stops: Non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

C. Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

D. Door Stops: Provide stops to protect walls, casework or other hardware.

1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.

2. Locate overhead stops for maximum possible opening. Consult with Owner for furniture locations. Minimum: 90deg stop / 95deg deadstop. Note degree of opening in submittal.

E. Seals: Finished to match adjacent frame color. Resilient seal material: polyurethane, polypropylene, nylon brush, silicone rubber or solid high-grade neoprene as scheduled. Do not furnish vinyl seal material. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability.

1. Proposed substitutions: submit for approval.

2. Solid neoprene: MIL Spec. R6855-CL III, Grade 40.

3. Non-corroding fasteners at in-swinging exterior doors.

4. Fire-rated Doors, Resilient Seals: UL10C / UBC Standard 7-2 compliant. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements. Where rigid housed resilient seals are scheduled in this section and the selected door manufacturer only requires an adhesive-mounted resilient seal, furnish rigid housed seal at minimum, or both the rigid housed seal plus the adhesive applied seal. Adhesive applied seals alone are deemed insufficient for this project where rigid housed seals are scheduled.

5. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C / UBC Standard 7-2. Where required, intumescent seals vary in requirement by door type and door manufacturer -- careful coordination required

F. Thresholds: As scheduled and per details. Comply with CBC Section 1133B.2.4.1. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval.

1. Exteriors: Seal perimeter to exclude water and vermin. Use sealant complying with requirements in Division 7 "Thermal and Moisture Protection". Non-ferrous 1/4inch fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL).

2. Fire-rated openings, 90min or less duration: use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253. Use threshold unit as scheduled. If none scheduled, request direction from Architect.

3. Fire-rated openings, 3hour duration: Thresholds, where scheduled, to extend full jamb depth.

4. Plastic plugs with wood or sheet metal screws are not an acceptable substitute for specified fastening methods.

5. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.

G. Through-bolts: Do not use. Coordinate with wood doors; ensure provision of proper blocking to support wood screws for mounting panic hardware and door closers. Coordinate with metal doors and frames; ensure provision of proper reinforcement to support machine screws for mounting panic hardware and door closers.

H. Silencers: Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered pre-punched silencer holes.

2.7 FINISH:

A. Generally BHMA 626 Satin Chromium.

1. Areas using BHMA 626 to have push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise noted.

B. Door closers: factory powder coated to match other hardware, unless otherwise noted.

C. Aluminum items: match predominant adjacent material. Seals to coordinate with frame color.

2.8 KEYING REQUIREMENTS:

A. Key System: Schlage Primus keyway, interchangeable core throughout. Key blanks available only from factory-direct sources, not available from after-market keyblank manufacturers. For estimate use factory GMK charge. Initiate and conduct meeting(s) with Owner to determine system keyway(s), keybow styles, and structure. Furnish Owner's written approval of the system..

1. Existing master key system.

2. Primus Level 3

3. Construction keying: furnish temporary keyed-alike cores. Remove at substantial completion and install permanent cylinders/cores in Owner's presence. Demonstrate that construction key no longer operates.

4. Temporary cylinders/cores remain supplier's property.

5. Furnish 10 construction keys.

6. Furnish 2 construction control keys.

7. Key Cylinders: furnish 6-pin solid brass construction.

B. Cylinders/cores: keyed at factory of lock manufacturer where permanent records are maintained. Locksets and cylinders same manufacturer.

C. Permanent keys: use secured shipment direct from point of origination to Owner.

1. For estimate: 3 keys per change combination, 5 master keys per group, 5 grand-master keys, 3 control keys.

D. Bitting List: use secured shipment direct from point of origination to Owner at completion.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS:

A. Can read and understand manufacturers' templates, suppliers hardware schedule and printed installation instructions. Can readily distinguish drywall screws from manufacturers furnished fasteners. Available to meet with manufacturers' representatives and related trades to discuss installation of hardware.

3.2 PREPARATION:

A. Ensure that walls and frames are square and plumb before hardware installation. Make corrections before commencing hardware installation.

B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.

1. Notify Architect of code conflicts before ordering material.

2. Locate levers, key cylinders, t-turn pieces, touchbars and other operable portions of latching hardware between 30 inches to 44 inches above the finished floor, per CBC Section 1133B.2.5.1.

C. Overhead stops: before installing, determine proposed locations of furniture items, fixtures, and other items to be protected by the overhead stop's action.

3.3 INSTALLATION

A. Install hardware per manufacturer's instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by Architect.

1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.

2. Use manufacturers' fasteners furnished with hardware items, or submit Request for Substitution with Architect.

3. Replace fasteners damaged by power-driven tools.

B. Locate floor stops no more that 4 inches from walls and not within paths of travel. See paragraph 2.2 regarding hinge widths, door should be well clear of point of wall reveal. Point of door contact no closer to the hinge edge than half the door width. Where situation is questionable or difficult, contact Architect for direction.

C. Locate overhead stops for minimum 90 degrees and maximum allowable degree of swing.

D. Drill pilot holes for fasteners in wood doors and/or frames.

E. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

3.4 ADJUSTING

A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.

1. Hardware damaged by improper installation or adjustment methods: repair or replace to Owner's satisfaction.

2. Adjust doors to fully latch with no more than 1 pound of pressure.

3. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10 seconds.

4. Adjust door closers per 1.9 this section.

B. Inspection: Use hardware supplier's consultant or consultant's agent. Include supplier's report with closeout documents.

C. Final inspection: Installer to provide letter to Owner that upon completion installer has visited the Project and has accomplished the following:

1. Re-adjust hardware.

2. Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.

3. Identify items that have deteriorated or failed.

4. Submit written report identifying problems

3.5 DEMONSTRATION:

A. Demonstrate mechanical hardware and electrical, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.6 PROTECTION/CLEANING:

A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

3.7 SCHEDULE OF FINISH HARDWARE

A. See door schedule in drawings for hardware set assignments.

HW SET: 001

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 002

1	EA	PANIC HARDWARE	CD98L 996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 003

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 004

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	CD98L 996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS441	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM
1	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM

INSTALL HEAD SEAL BEFORE CLOSER

HW SET: 005

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 006

1	EA	FIRE EXIT DEVICE	98L-F 996L-2	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 007

2	EA	CONTINUOUS HINGE	112HD	AL	IVE
1	EA	PANIC HARDWARE	CD9847DT X 990DT	626	VON
1	EA	PANIC HARDWARE	CD9847NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
3	EA	PRIMUS CORE ONLY	20-740	626	SCH
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	MOUNTING PLATE	4110-18	689	LCN
2	EA	FLOOR STOP & HOLDER	FS40 41 42 43 AS REQU'D	626	IVE
2	EA	DOOR SWEEP	309AP	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
1			SEALS BY DOOR MANUFACTURER		

HW SET: 008

2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 009

1	EA	PANIC HARDWARE	CD9827EO X LBR	626	VON
1	EA	PANIC HARDWARE	CD9827L 996L X LBR	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
3	EA	PRIMUS CORE ONLY	20-740	626	SCH
2	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 010

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 011

3	EA	HINGE	3CB1HW 5 X 4.5 NRP	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 012

1	EA	CONTINUOUS HINGE	112HD	AL	IVE
1	EA	PULL/PUSHBAR	9190-0-NO	630	IVE
1	EA	SURFACE CLOSER	4011 DEL	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE

HW SET: 013

1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	SURFACE CLOSER	4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 014

3	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 015

1	EA	CONST LATCHING BOLT	FB61T	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 016

1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 017

1	EA	CONST LATCHING BOLT	FB61T	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 018

1	EA	CONTINUOUS HINGE	112HD	AL	IVE
1	EA	PANIC HARDWARE	CD98NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	FLOOR STOP	FS441	626	IVE
1	EA	DOOR SWEEP	309AP	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
2			SEALS BY DOOR MANUFACTURER		

HW SET: 019

6	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	SET	AUTO FLUSH BOLT	FB41P	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
1			ASTRAGAL BY DOOR MANUF.		
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	SURFACE CLOSER	4011T W/ BUMPER	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 020

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	PR	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1			ASTRAGAL BY DOOR MANUF.		
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 021

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	PR	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9480T 06A	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1			ASTRAGAL BY DOOR MANUF.		
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP & HOLDER	FS40 41 42 43 AS REQU'D	626	IVE
1	EA	HEAD SEAL	S88		PEM
2	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM

HW SET: 022

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9480T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP & HOLDER	FS40 41 42 43 AS REQU'D	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM
1	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM

INSTALL HEAD SEAL BEFORE CLOSER

HW SET: 023

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	98L 996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA	695	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS441	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM
1	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM

INSTALL HEAD SEAL BEFORE CLOSER

HW SET: 024

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	PANIC HARDWARE	CD9875L 996L	626	VON
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	IC MTSE CYL L CAM	30-138 ICX	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 025

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	MULLION	KR4954 X 2-154	689	VON
1	EA	PANIC HARDWARE	98EO	626	VON
1	EA	PANIC HARDWARE	CD98NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX (MULLION)	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
3	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	SET	MEETING STILE SEAL	351C X 351CS	AL	PEM
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP & HOLDER	FS40 41 42 43 AS REQU'D	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM
2	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM

INSTALL HEAD SEAL BEFORE CLOSERS

HW SET: 026

3	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	OVERHEAD STOP	100S	613	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 027

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 028

3	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 HEDA	689	LCN
1	EA	OVERHEAD STOP	100S	613	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 029

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	SET	AUTO FLUSH BOLT	FB41P	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1	EA	ASTRAGAL	570, 572, 574 AS REQU'D	630	NGP
2	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 030

3	EA	HINGE	3CB1HW 5 X 4.5 NRP	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 031

6	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
2	EA	MANUAL FLUSH BOLT	FB358	626	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
2	EA	WALL STOP	WS401CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 032

3	EA	HINGE	3CB1HW 5 X 4.5 NRP	652	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8302-0 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4111 DEL EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM

INSTALL HEAD SEAL BEFORE CLOSER

HW SET: 033

1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 034

1	EA	FIRE EXIT HARDWARE	9847WDC-EO-F	626	VON
1	EA	PANIC HARDWARE	9847WDC-L 996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
2	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 035

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	98EO	626	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 036

2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 037

1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 038

2	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	3CB1 4.5 X 4.5 TW8	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY DIVISION 16722	626	SCE
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1			POINT TO POINT WIRING DIAGARM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 039

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	PANIC HARDWARE	~~RX98L E996L~~ RX-LC 98 EO	626	VON
1	EA	~~RIM CYLINDER~~ ELECT EXIT TRIM RIM	~~20-057 ICX~~ BY DIVISION 16722	626	~~SCH~~ SCE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CORE ONLY	23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING DIAGARM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 040

~~3~~ 2	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	~~PANIC HARDWARE~~ ELECTRIC HINGE	~~CD98NL X 990NL~~ 3CB1HW 4.5 X 4.5 TW8	~~626~~ 630	~~VON~~ IVE
1	EA	PANIC HARDWARE	RX-LC-CD98NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS441	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM
1	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
1	EA	DOOR POSITION SWITCH	7764	628	SCE

INSTALL HEAD SEAL BEFORE CLOSERS
MONITORED ONLY BY SECTION 16722

HW SET: 041

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	FIRE EXIT HARDWARE	~~RX-98L-F E996L~~ RX-LC-98EO-F	626	VON
~~2~~ 1	EA	~~RIM CYLINDER~~ ELECT EXIT TRIM RIM	~~20-057 ICX~~ BY SECTION 16722	626	~~SCH~~ SCE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CORE ONLY	23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722
INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 042

2	EA	POWER TRANSFER	EPT-10	689	VON
2	EA	CONTINUOUS HINGE	112HD	AL	IVE
1	EA	PANIC HARDWARE	RX-LC-EL9847DT X 990DT	626	VON
1	EA	PANIC HARDWARE	RX-LC-EL9847NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	FLOOR STOP	FS441	626	IVE
2	EA	DOOR SWEEP	309AP	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
1	EA	POWER SUPPLY	PS873-2	GRY	VON
1			POINT TO POINT WIRING DIAGRAM		
1			SEALS BY DOOR MANUFACTURER		
~~1~~			~~WIRING DIAGARM~~		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

CARD READER BY ~~OTHERS~~ SECTION 16722

HW SET: 043

1	EA	POWER TRANSFER	EPT-10	689	VON
~~2~~ 1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 044

6	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	ASTRAGAL	570, 572, 574 AS REQU'D	630	NGP
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 045

2	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	~~PANIC HARDWARE~~ ELECTRIC EXIT TRIM SVR	~~RX-EL9827EO X LBR~~ BY SECTION 16722	626	~~VON~~ SCE
~~1~~ 2	EA	PANIC HARDWARE	~~RX-EL9827L 996L X LBR~~ RX-LC-9827EO X LBR	626	VON
~~1~~	~~EA~~	~~RIM CYLINDER~~	~~20-057 ICX~~	~~626~~	~~SCH~~
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CORE ONLY	23-030 (CONSTRUCTION CORE)	626	SCH
2	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
~~1~~	~~EA~~	~~POWER SUPPLY~~	~~PS873-2~~	~~GRY~~	~~VON~~
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 046

3	EA	HINGE	3CB1HW 5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 047

2	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8302-0 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4111 DEL EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 048

1	EA	POWER TRANSFER	EPT-10	689	VON
~~2~~	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 049

2	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	3CB1 4.5 X 4.5 TW8	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 050

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 051

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	CONTINUOUS HINGE	112HD EPT	AL	IVE
1	EA	PANIC HARDWARE	RX-LC-EL98NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	FLOOR STOP	FS441	626	IVE
1	EA	DOOR SWEEP	309AP	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
1	EA	POWER SUPPLY	PS873-2	GRY	VON
2			SEALS BY DOOR MANUFACTURER		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
1	EA	DOOR POSITION SWITCH	7764	628	SCE

CARD READER BY ~~OTHERS~~ SECTION 16722

HW SET: 052

5	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	3CB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	CONST LATCHING BOLT	FB51T	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1			ASTRAGAL BY DOOR MANUF.		
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 053

~~6~~ 5	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	3CB1 4.5 X 4.5 TW8	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	SET	AUTO FLUSH BOLT	FB41P	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A RX	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1			ASTRAGAL BY DOOR MANUF.		
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
2	EA	SILENCER	SR64	GRY	IVE
2	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 054

~~6~~ 5	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	ELECTRIC HINGE	3CB1HW 4.5 X 4.5 TW8	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	PR	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9480T 06A RX	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1			ASTRAGAL BY DOOR MANUF.		
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS441	613	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM
2	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
2	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 055

5	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	3CB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	PANIC HARDWARE	~~RX-9875L E996L~~ RX-LC-9875EO	626	VON
1	EA	ELECTRIC EXIT TRIM MS	BY SECTION 16722	626	SCE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~IC MTSE CYL L CAM~~ CORE ONLY	~~30-138 ICX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
2	EA	SILENCER	SR64	GRY	IVE
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 056

~~6~~ 3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	ELECTRIC HINGE	3CB1 4.5 X 4.5 TW8	630	IVE
1	EA	MULLION	KR4954 X 2-154	689	VON
1	EA	PANIC HARDWARE	RX-LC-98EO	626	VON
1	EA	PANIC HARDWARE	RX-LC-98L 996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX (MULLION)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	SET	MEETING STILE SEAL	351C X 351CS	AL	PEM
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS441	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM
2	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
2	EA	DOOR POSITION SWITCH	7764	628	SCE

INSTALL HEAD SEAL BEFORE CLOSERS
~~CARD READER BY OTHERS~~ MONITORED ONLY BY SECTION 16722

HW SET: 057

~~4~~3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	3CB1 4.5 X 4.5 TW8	652	IVE
1	EA	DUTCH DOOR BOLT	55	626	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A RX	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
2	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 058

6	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
1	EA	ASTRAGAL	570, 572, 574 AS REQU'D	630	NGP
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 059

2	EA	HINGE	3CB1HW 5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	3CB1HW 5 X 4.5 TW8	652	IVE
1	EA	PANIC HARDWARE	~~RX98L E996L~~ RX-LC 98 EO	626	VON
1	EA	ELEC. EXIT TRIM RIM	BY SECTION 16722	626	SCE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CORE ONLY	23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	SURFACE CLOSER	4111 DEL EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 060

2	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	FIRE EXIT HARDWARE	RX-LC-9847WDC-EO-F	626	VON
1	EA	PANIC HARDWARE	RX-LC-9847WDC-L E996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
2	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

INTUMESCENT SEALS BY DOOR MANUFACTURER
CARD READER BY ~~OTHERS~~ SECTION 16722

HW SET: 061

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 062

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB51T	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1			ASTRAGAL BY DOOR MANUF.		
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 063

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	PR	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1			ASTRAGAL BY DOOR MANUF.		
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	OVERHEAD STOP	100S	613	GLY
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 064

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	CONTINUOUS HINGE	112HD EPT	AL	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 065

3	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	3CB1HW 4.5 X 4.5 TW8	652	IVE
~~2~~ 1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

INTUMESCENT SEALS BY DOOR MANUFACTURER
~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 066

~~3~~ 2	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	3CB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	FIRE EXIT DEVICE	~~98L-F 996L-2~~ RX-LC-98L-F 996L-2	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM
1	EA	DOOR POSITION SWITCH	7764	628	SCE

INTUMESCENT SEALS BY DOOR MANUFACTURER
MONITORED ONLY BY SECTION 16722

HW SET: 067

1	EA	POWER TRANSFER	EPT-10	689	VON
~~2~~ 1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	4041	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 068

1	SET	AUTO FLUSH BOLT	FB41P	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1	EA	SURFACE CLOSER	4041	689	LCN
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	MOUNTING PLATE	4040-18TJ	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 069

3	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 070

3	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 071

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	98L 996L	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
~~2~~ 1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 072

6	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	SET	AUTO FLUSH BOLT	FB41P	630	IVE
~~2~~ 1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1	EA	SURFACE CLOSER	4021	689	LCN
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	MOUNTING PLATE	4020-18	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 073

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	ASTRAGAL	570, 572, 574 AS REQU'D	630	NGP
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

HW SET: 074

1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ENTRANCE LOCK	L9453T 06A L583-363	626	SCH
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 075

3	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 076

1	EA	CONTINUOUS HINGE	112HD	AL	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
2			SEALS BY DOOR MANUFACTURER		

HW SET: 077

1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	PADLOCK	KS43F3200	452	SCH
			BALANCE OF HARDWARE BY GATE MANUFACTURER		

HW SET: 078

2	EA	CONTINUOUS HINGE	112HD	AL	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	PR	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1			ASTRAGAL BY DOOR MANUF.		
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	FLOOR STOP	FS441	626	IVE
2	EA	SEALS	290AS	AL	PEM
1	EA	HEAD SEAL	S88		PEM
2	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM

HW SET: 079

1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA		IC CYLINDER AS REQUIRED	626	SCH
			BALANCE OF HARDWARE BY DOOR MANUFACTURER		

HW SET: 080

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	ENTRANCE LOCK	L9453T 06A L583-363	626	SCH
1	EA	SURFACE CLOSER	4111 AVB SHCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM

HW SET: 081

3	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 082

1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 083

2	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	~~PANIC HARDWARE~~ ELECTRIC HINGE	~~98EO~~ 3CB1HW 4.5 X 4.5 TW8	~~626~~ 652	~~VON~~ IVE
1	EA	PANIC HARDWARE	RX-LC-98EO	626	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 084

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
1	EA	DOOR POSITION SWITCH	7764	628	SCE

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722
INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 085

2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 086

3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 DEL EDA	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 087

5	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	3CB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	ASTRAGAL	570, 572, 574 AS REQU'D	630	NGP
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 088

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1	EA	SURFACE CLOSER	4041	689	LCN
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	MOUNTING PLATE	4040-18TJ	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722.
INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 089

2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 090

1	EA	POWER TRANSFER	EPT-10	689	VON
~~2~~ 1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 091

1	EA	PANIC HARDWARE	CD98L 996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 092

1	EA	~~CONTINUOUS HINGE~~ POWER TRANSFER	~~112HD~~ EPT-10	~~AL~~ 689	~~IVE~~ VON
1	EA	~~PANIC HARDWARE~~ CONTINUOUS HINGE	~~CD98NL X 990NL~~ 112HD EPT	~~626~~ AL	~~VON~~ IVE
1	EA	PANIC HARDWARE	RX-LC-CD98NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	FLOOR STOP	FS441	626	IVE
1	EA	DOOR SWEEP	309AP	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
2			SEALS BY DOOR MANUFACTURER		
1	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 093

1	EA	~~FIRE EXIT DEVICE~~ POWER TRANSFER	~~98L-F 996L-2~~ EPT-10	~~626~~ 689	VON
1	EA	FIRE EXIT DEVICE	RX-LC-98L-F 996L-2	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1	EA	DOOR POSITION SWITCH	7764	628	SCE

INTUMESCENT SEALS BY DOOR MANUFACTURER
MONITORED ONLY BY SECTION 16722

HW SET: 094

1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	SURFACE CLOSER	4041	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 095

3	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 096

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A RX	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 097

~~3~~ 2	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	3CB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A RX	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 098

6	EA	HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	MULLION	KR4954 X 2-154	689	VON
1	EA	PANIC HARDWARE	RX-LC-EL98DT X 990DT	626	VON
1	EA	PANIC HARDWARE	RX-LC-EL98NL X 990NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX (MULLION)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	SET	MEETING STILE SEAL	351C X 351CS	AL	PEM
2	EA	SURFACE CLOSER	4111 AVB EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS441	626	IVE
1	SET	HEAD SEAL	2891AS	AL	PEM
2	EA	SEALS	290AS	AL	PEM
2	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	272A MSA	AL	PEM
1	EA	POWER SUPPLY	PS873-2	GRY	VON
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

INSTALL HEAD SEAL BEFORE CLOSERS
CARD READER BY ~~OTHERS~~ SECTION 16722

HW SET: 099

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A RX	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 100

~~3~~ 2	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	~~PRIMUS CORE ONLY~~ ELECTRIC HINGE	~~20-740~~ 3CB1HW 4.5 X 4.5 TW8	~~626~~ 652	~~SCH~~ IVE
1	EA	~~STOREROOM LOCK~~ PRIMUS CORE ONLY	~~L9080T 06A~~ 20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A-RX	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM
1	EA	DOOR POSITION SWITCH	7764	628	SCE

INTUMESCENT SEALS BY DOOR MANUFACTURER
MONITORED ONLY BY SECTION 16722

HW SET: 101

2	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	3CB1 4.5 X 4.5 TW8	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	~~EU STOREROOM LOCK~~ CORE ONLY	~~L9080TEU 06A - RX~~ 23-030 (CONSTRUCTION CORE)	626	SCH
1	EA	ELECTRIC MORTISE LOCK	BY SECTION 16722	626	SCE
1	EA	SURFACE CLOSER	4011T W/ BUMPER	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1			POINT TO POINT WIRING ~~DIAGARM~~ DIAGRAM		
~~1~~	~~EA~~	~~DOOR POSITION SWITCH~~	~~7764~~	~~628~~	~~SCE~~

~~CARD READER BY OTHERS~~ ACCESS CONTROL BY SECTION 16722

HW SET: 102

1	EA	CONST LATCHING BOLT	FB51T	630	IVE
~~2~~ 1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 103

1	EA	~~PANIC HARDWARE~~ POWER TRANSFER	~~CD98L 996L~~ EPT-10	~~626~~ 689	VON
1	EA	PANIC HARDWARE	RX-LC-CD98L 996L	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX X XQ11-948 (DOGGING)	626	SCH
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY DIVISION 16722

HW SET: 104

1	EA	PANIC HARDWARE	98L 996L-BE	626	VON
1	EA	SURFACE CLOSER	P4041	689	LCN
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 105

3	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	SURFACE CLOSER	4011T W/ BUMPER	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 106

3	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 107

3	EA	HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	SURFACE CLOSER	4011T W/ BUMPER	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 108

1	EA	POWER TRANSFER	EPT-10	689	VON
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A RX	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 109

3	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STORE LOCK	L9466T 06A	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET	SEALS	S88 HEAD AND JAMBS		PEM

INTUMESCENT SEALS BY DOOR MANUFACTURER

HW SET: 110

1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 111

1	EA	POWER TRANSFER	EPT-10	689	VON
1	SET	AUTO FLUSH BOLT	FB41P	630	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9071T 06A RX	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
1	EA	SURFACE CLOSER	4041	689	LCN
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	MOUNTING PLATE	4040-18TJ	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

INTUMESCENT SEALS BY DOOR MANUFACTURER
MONITORED ONLY BY SECTION 16722

HW SET: 112

4	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	DUTCH DOOR BOLT	55	626	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	OFC LOCK W / EZ TURN	L9050T 06A L583-363	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
4	EA	SILENCER	SR64	GRY	IVE

HW SET: 113

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
1	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 114

3	EA	HINGE	3CB1 4.5 X 4.5 NRP	652	IVE
2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STORE LOCK	L9466T 06A	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 115

2	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STORE LOCK	L9466T 06A	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
1	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

HW SET: 116

1	EA	POWER TRANSFER	EPT-10	689	VON
1	EA	CONST LATCHING BOLT	FB51T	630	IVE
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	STOREROOM LOCK	L9080T 06A-RX	626	SCH
1	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		
2	EA	DOOR POSITION SWITCH	7764	628	SCE

MONITORED ONLY BY SECTION 16722

HW SET: 117

1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	FIRE EXIT HARDWARE	9875L-BE-F 996L-BE	626	VON
1	EA	MTSE CYL, STRGHT CAM	20-061 ICX	626	SCH
1	EA	PRIMUS CORE ONLY	20-740	626	SCH
1	EA	COORDINATOR	COR X MB X FL	628	IVE
2	EA	SURFACE CLOSER	P4041	689	LCN
2	EA	DOME STOP W/RISER	FS436 435 438 437 AS REQU'D	626	IVE
			BALANCE OF HARDWARE BY ACOUSTIC DOOR MFR.		

END OF SECTION

SECTION 08800
GLASS AND GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. All glass and glazing for the Project except as noted below.

2. Glazing accessories.

3. Glazing sealants.

B. Related work:

1. Divisions 7 and 9 for sealants other than required for the work of this Section.

2. Division 10 for glass and glazing in equipment such as fire extinguisher cabinets.

1.2 REFERENCES

A. Glazing publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA "Glazing Manual" and "Laminated Glass Reference Manual".

2. AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines".

3. SIGMA TM-3000, "Vertical Glazing Guidelines," and SIGMA TB-3001, "Sloped Glazing Guidelines".

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following; defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat-treated) required to meet or exceed the following criteria.

1. Glass thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

a. Specified design wind loads: Per CBC.

b. Probability of breakage for vertical glazing: 8 lites per 1000 for lites set vertically or not more than 15-degree off vertical and under wind action. Assume load duration of 60 seconds.

1) Provide heat-treated glass where annealed glass would be vulnerable to thermal breakage.

c. Probability of breakage for sloped glazing: One lite per 1000 for lites set more than 15 degrees off vertical and under wind action. Assume load duration of 30 days.

d. Maximum lateral deflection: For the following types of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or one inch, whichever is less.

1) For monolithic-glass lites heat-treated to resist wind loads.

2) For insulating glass.

3) For laminated-glass lites.

e. Minimum glass thickness for exterior lites: 6 mm.

f. Thickness of tinted and heat-absorbing glass: Provide the same thickness for each tint color indicated throughout Project.

2. Thermal movements:

a. Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

b. Temperature change (range): Minimum material temperature increase of 100-degree F and decrease of 50-degree F relative to nominal condition 120-degree F, ambient; 180-degree F material surfaces.

3. Thermal performance properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

a. For monolithic glass lites, properties are based on units with lites 6 mm thick.

b. For laminated glass lites, properties are based on products of construction indicated.

c. For insulated glass units, properties are based on units with lites 6 mm thick and a nominal 1/2 in. wide interspace.

1.4 SUBMITTALS

A. Samples:

1. Twelve-inch square labeled samples of each type and color of glass, with taped or ground edges.

2. Coated glass samples shall show extremes of color range.

3. Glass indicated or required to be “heat-treated” need not be when submitting samples.

B. Certification: Glass manufacturer’s certification as specified.

1. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements. Include wind pressure analysis, thermal stress analysis, including shading effects, and review of shop drawings stating that details are suitable for proposed glass products.

2. Separate certifications are not required for glazing materials bearing the manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program of a recognized certification agency or independent testing agency acceptable to authorities having jurisdiction.

C. Glazing schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

D. Preconstruction adhesion and compatibility test report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

E. Product test reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:

1. Tinted float glass.

2. Coated float glass.

3. Insulating glass.

4. Glazing sealants.

5. Glazing gaskets.

F. Labels: Provide NFRC Rating Labels as required by 2007 California Energy Code. Reference 2007 compliance guide for information required

1.5 QUALITY ASSURANCE

A. Glazier’s qualifications: Experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).

B. Fabricator’s qualifications: When the glass manufacturer has a certification program, the fabricator shall have a current “Certified Fabricator” certificate form the glass manufacturer.

C. Source limitations for clear glass: Obtain clear float glass from one primary glass manufacturer.

D. Source limitations for tinted glass: Obtain tinted, heat absorbing, and light reducing float glass from one primary glass manufacturer for each tint color indicated.

E. Source limitations for coated glass: Obtain coated glass from one manufacturer for each type of coating and each type and class of float glass indicated.

F. Source limitations for insulating glass: Obtain insulating-glass units from one manufacturer using the same type of glass and other components for each type of unit indicated.

G. Source limitations for laminated glass: Obtain laminated-glass units from one manufacturer using the same type of glass lites and interlayers for each type of unit indicated.

H. Source limitations for glazing accessories: Obtain glazing accessories from one source for each product and installation method indicated.

I. 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.

J. Safety glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.

1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

K. Insulating glass certification program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency.

1. Insulating Glass Certification Council.

2. Associated Laboratories, Inc.

3. National Accreditation and Management Institute.

L. Mockups: Before glazing, provide mockups for each glass product indicated below in accordance with the following requirements, using materials indicated for the completed Work. Install glass mockups in curtainwall mockup specified in Section 08900.

1. Build mockups in the location and of the size indicated in Section 08900.

2. Build mockups with the following kinds of glass to match glazing systems required for Project, including typical lite size, framing systems, and glazing methods:

a. Heat-strengthened coated glass.

b. Fully tempered glass.

c. Spandrel glass.

d. Laminated glass.

e. Coated insulating glass.

3. Obtain Architect's approval of mockups before starting fabrication.

4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

5. Demolish and remove mockups when directed.

6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

M. Manufacturer’s certification: Submit manufacturer certification that.

1. All materials to be used in the glazing system such as sealants, setting blocks, spacers, backing rods, metal finishes, etc. have been reviewed by the glass manufacturer.

2. These materials are compatible with the glass supplied to the Project site.

3. These materials will not cause deterioration, premature aging, and staining of adjacent materials.

N. Labeling:

1. Submit a certificate stating that the glass furnished for the Project complies with the Specifications.

2. Label each piece of heat-treated glass with a permanent logo etched in one corner to identify the fabricator.

O. Spandrel glass: Spandrel glass with an opacifier shall meet the fall-out resistance of the Glass Tempering Association Specification No. 89-1-6, “Specification for Environmental Durability of Fully Tempered or Heat-Strengthened Glass with Applied Opacifiers”.

1.6 HANDLING

A. Storage: Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, run-off, and other causes.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of bulk sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation.

1.8 WARRANTY

A. Refer to Sections 08410 and 08900 for exterior glass.

B. Warrant laminated glass against delamination, deterioration of plastic sheet or laminating film, loss of transparency, color change or other forms of deterioration due to defective materials or lamination, for 5 years after Substantial Completion.

C. Warrant insulating glass against fogging, loss of transparency and frost build-up between the glass panes due to defective materials or sealant failure for 5 years after Substantial Completion.

D. Warrant coating and ceramic frit on spandrel glass against cracking, peeling, wrinkling, color fading, blistering, flaking, delaminating, staining and discoloration for 10 years after Substantial Completion.

E. Glass shall not experience spontaneous breakage.

1. This Specification defines nickel sulfide stones as a glass material defect.

2. Installed tempered glass which breaks due to nickel sulfide stones shall be included in the warranty.

F. Replace defective materials and workmanship during the warranty period at no cost to the District.

PART 2 - PRODUCTS

2.1 GLASS

A. General:

1. Float glass shall comply with ASTM C 1036; heat-treated glass shall comply with ASTM A 1048.

2. ASTM C 1172 Standard Specification for Laminated Architectural Flat Glass.

3. ASTM C 1376 Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass

4. ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation.

5. ANSI Z97.1 American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications Method of Test.

6. US Consumer Product Safety Commission CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials

7. Glass shall be free from bubbles, smoke vanes, air holes, scratches and other defects.

8. Laminated glass shall comply with ASTM C 1172. Glass in the lamination shall be from the same manufacturer when heat-strengthened.

9. The same manufacturer shall make all tinted glass.

10. Fabricate tempered glass by horizontal (roller hearth) process with roll wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

11. Comply with Code and the Drawings for glass in hazardous locations. Laminated glass subject to human impact shall comply with CPSC 16 CFR Part 1201.

12. Unless otherwise indicated or specified, overall thickness of each glass type and composite thickness of multiple layer glass types shall be consistent throughout the Project.

13. Provide insulating glass assemblies CBA rated by IGCC when tested in compliance with ASTM E 774, and permanently labeled with the appropriate certification label of IGCC, ALI or NCTL.

B. Glass types: Refer to the schedule at the end of this Section.

2.2 GLAZING MATERIALS

A. Laminated glass interlayer: Clear, with a proven record not to bubble, discolor, or loose physical and mechanical properties after laminating glass lites and during service life.

1. For glass-to-glass: 0.03-inch thick, clear, Polyvinyl butyral; Saflex by Monsanto Co. or Butacite by EI du Pont de Nemours & Co., Inc.

a. For glass-to-polycarbonate: Polyurethane.

B. Setting block: Neoprene or, in the case of structural silicone glazing, dense extruded silicone; both with a hardness of 85 ±5 durometer Shore A with a minimum length of 4" or as required by GANA guidelines. For flush glazed skylights, provide L shaped setting blocks.

C. Side blocks: Neoprene or dense silicone with a harness of 65 ±5 durometer Shore A.

D. Spacer: Neoprene, silicone, or EPDM, 50 to 60 durometer hardness, compatible with sealants used.

E. Sealants:

1. For structural glazing: High modulus (structural) silicone sealant, 2-component, non acidic, neutral curing silicone which meets or exceeds Federal Specification TT-S-00227, Type II, Class B and ASTM C920, Type M, NS, Class 12.5.

a. Color: Black or clear as selected by Architect.

b. Acceptable products:

1) Dow Corning 995 and 795 (DC 983 is not acceptable for use with painted substrate without incorporation of special substrate preparation requirements utilizing Scotch Brite pads, alcohol and barrier primer).

2) General Electric Ultra Glaze SSG 4400 and Ultra Glaze 4000.

3) Tremco Proglaze SSG.

4) Pecora 895 or 2-Part Fast Cure.

c. Painted surfaces in contact with structural silicone must be primed with a primer approved for use by the sealant manufacturer.

2. For primary seal of insulating units: Manufacturer standard sealant.

3. For all other conditions: Medium and low modulus (weatherseal) silicone sealant, one-part, non acidic, neutral curing, Type S, Grade NS, Class 25, Use NT, capable of withstanding movements from plus 50 to minus 50 for medium modulus and plus 100 to minus 50 percent for low modulus based on original joint design.

a. Color: Match Architect's paint color for sealant.

b. Acceptable products:

1) Dow Corning 795 and 790.

2) General Electric - Silpruf, Silpruf LM.

c. Only low modulus sealant, such as Dow 790 or GE Silpruf LM, shall be used when sealing to cementitious substrate.

F. Glazing gasket: Resilient, continuous neoprene, (except as specified below) extrusions, 40 to 60 Shore A durometer hardness, meeting the requirements of ASTM C 509 for cellular (closed-cell) material, and AAMA SG-1 for non-cellular (dense) material.

1. Gaskets shall have a continuous mechanical engagement to framing members and factory molded corners.

2. Gasket corners, whether molded or not, shall be bedded in elastomeric sealant compatible with glazing gaskets.

3. When in direct contact with silicone sealants, gaskets, spacers and setting blocks shall be heat cured silicone rubber based material chemically compatible with the silicone sealant and with sufficient hardness for the specific purpose intended. Compatibility testing by the silicone sealant supplier/manufacturer shall be required.

4. Design interior and exterior gasket profiles to produce a glass edge pressure of 12 psf unless otherwise recommended by the glass manufacturer.

G. Compressible filler rod:

1. Closed-cell or waterproof jacketed rod stock of synthetic rubber or plastic foam compatible with sealants used, flexible and resilient, with 5 to 10 psi compressive strength at 25 percent deflection.

2. Do not use vinyl foam stock.

H. Cleaner, primer and sealer: Type recommended by sealant or gasket manufacturer.

I. Partition closure: Michael Rizza Co., LLC “Partition Closures” consisting of an extruded aluminum retainer channel and a compressible solid silicone closure.

2.3 FABRICATION

A. Cutting:

1. Obtain sizes from shop drawings or by field measurement. Cut glass to fit each opening with at least the minimum edge clearance and bite on glass recommended by glass manufacturer.

2. When glass will be precut to sizes obtained from shop drawings, take field measurements of each opening before glazing to verify adequate bite on glass and minimum edge clearance.

3. Glaze openings, which do not fall within tolerances for which precut glass has been sized only with glass specially cut to fit such openings.

4. Do not nip glass edges. Edges may be wheel cut or sawed and seamed at manufacturer's option.

B. Edge quality of annealed and heat-strengthened glass:

1. Shark teeth shall not penetrate more than half of glass thickness.

2. Serration hackle shall not penetrate more than 10 percent of glass thickness.

3. Flare shall not exceed 0.062-inch as measured perpendicular to glass surface edge.

4. Bevel shall not exceed 0.062-inch.

5. Flake chip depth shall not exceed 0.031-inch and length or diameter shall not exceed 0.25-inch.

6. Rough chips are not permitted. Rough chips are those that exceed dimensional limits for flake chips.

7. For glass to be cut at site, provide glass 2-inch larger than required, in both dimensions, to facilitate cutting of clean-cut edges without seaming or nipping.

8. Do not cut, seam, nip, or abrade tempered and heat strengthened glass after tempering.

9. Provide flat ground edges with arised corners where glass edge is not covered by a metal stop.

C. When full height vision glass is shown (without intermediate horizontals or rails), safety glazing is only required on the inboard lite for Code compliance except on the ground floor or other areas where there is a walking surface on both sides. Alternately, if an aluminum rail is used on the interior of the framing, neither lite need be safety glazing.

D. Laminated glass:

1. Factory-laminate using manufacturer standard heat-plus-pressure process.

2. Exercise caution to exclude dirt and other foreign materials from lamination and to eliminate all voids.

3. Arrange each layer of laminate in the order indicated, and label exterior (or interior) face of each completed unit so that there will be no error in the placement during installation.

4. Conceal processed and coated glass in the lamination.

5. Factory-cut units to proper size; do no cutting at Project site.

E. Glass in sloped glazing conditions (15 degrees or more from vertical) shall be laminated with both lites heat-strengthened. Fully tempered glass is not allowed, whether monolithic, laminated, or as the inboard lite of an insulated glass unit.

F. Insulating glass:

1. Provide black aluminum spacers with bent (not mitered or spliced) corners; only one seam is allowed in each spacer of each unit.

2. The date of the manufacture of the unit shall be discretely identified on the spacer (top of unit, left or right corner).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions and measurements affecting the work of this Section at site.

B. Verify that openings and frames to be glazed are within allowable tolerances, plumb, level and square.

C. Inspect framing joint intersections to insure that the offset in the joinery will not impose undue edge pressure on the glass in compliance with GANA, Glazing Manual, and Sealant Manual, guidelines.

D. Correct other detrimental conditions before proceeding with glazing.

3.2 STANDARDS AND PERFORMANCE

A. Watertight and airtight installation is required for each piece of glass installed in an exterior wall or skylight.

B. Each installation must withstand normal temperature changes, wind loading, and impact from normal operation for doors, without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.

C. Installed glass shall be free from rattle.

D. Protect glass from damage at all times during handling, installation and operation of the building until Substantial Completion.

E. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are specified.

F. Comply with GANA, Glazing Manual, and Sealant Manual guidelines, except as otherwise.

G. Except as recommended otherwise by the manufacturers of the glass and glazing materials, comply with GANA Glazing Manual and the following:

1. Provide minimum nominal glass bite of 0.375-inch on monolithic lites; 1/2 inch on insulated glass units.

2. Where joint movement will result in variable glass bite, increase nominal bit to provide 0.375-inch minimum bite and 0.25-inch minimum edge clearance.

H. Inspect each piece of glass immediately before installation, and eliminate those with edge damage or face imperfections.

I. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.

3.3 PREPARATION FOR GLAZING

A. Immediately before glazing, clean the glazing channel and other framing members to receive glass.

1. Remove coatings not firmly bonded to the substrate.

2. Verify that framing is satisfactory to receive the glass.

B. Apply primer or sealer to joint surfaces when recommended by sealant manufacturer.

3.4 GLASS INSTALLATION

A. Erect each pane of glass square, plumb, and with uniform clearances between panel and rebates.

B. Follow glass manufacturer's instructions and GANA Standards. Provide minimum nominal glass bite of 0.375 inch on monolithic lites, and 1/2 inch on insulating glass units. Maintain minimum bed clearance between glass and frame.

C. Do not nip glass. Do not install glass with edge damage.

D. Install glass with required glass markings right side up so they can normally be read from the exterior.

E. Setting blocks:

1. Minimum length of 4 inches or as required by GANA guidelines; minimum width shall correspond to the glass thickness and retaining member but, in no case less than the glass thickness at point of contact.

2. Locate at quarter points, or in accordance with GANA glazing guidelines.

3. Secure against migration.

4. Shims used in conjunction with setting blocks must be of the same material, hardness, length and width as the setting blocks.

F. Side blocks:

1. Locate side blocks where required within the upper half of each jamb for each light.

2. Install block with 1/8-inch clearance between block and glass bearing surface.

3. Block shall be sufficient length to prevent point loading on the glass.

4. Side blocks are not required where an individual glass light is continuously sealed with silicone at 2 or more edges, when the sealant is installed immediately following the setting of the glass.

G. Provide spacers inside and out unless continuous gaskets are used. Use glass manufacturer recommended size and spacing.

H. Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels, except as needed for drainage and weep holes) depending on light size, thickness and type of glass, and complying with manufacturer's recommendations.

I. Sealant shall not be adhered to, or placed against, the edge of a laminated glass unit interlayer.

J. Force sealants into channel to eliminate voids and to assure complete "wetting" or bond of sealant to glass and channel surfaces.

K. Tool exposed surfaces of sealants to provide a substantial "wash away" from the glass.

L. Install pressurized gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.

M. Clean and trim excess glazing materials from the glass, stops and frames promptly after installation, and eliminate stains and discolorations.

N. Where wedge shaped gaskets are driven into one side of the channel to pressurize the sealant or gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement.

1. Anchor gasket to stop with matching ribs, or with adhesive.

O. Clean, prime and mask structural silicone joints the same day when silicone is applied.

3.5 CURING/PROTECTING/CLEANING

A. Cure glazing sealants and compounds in compliance with their manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.

B. Protect glass from breakage immediately upon installation. Do not apply markers of any type to glass.

C. Before Substantial Completion, remove and replace glass which is broken, chipped, cracked, abraded, stained or damaged in other way, including natural causes, accidents and vandalism.

D. Maintain glass in a clean condition during construction so that it will not be damaged by corrosive action and will not contribute (by wash-off) to the deterioration of glazing materials and other work.

E. Remove remaining labels and wash and polish glass on both faces not more than 4 days prior to District's acceptance of the work in each area. Comply with GANA 01-0300 and the glass manufacturer's recommendations.

3.6 GLASS SCHEDULE

A. Type GL-1: 1/4 in. thick, clear, tempered float glass.

B. Type GL-2: 1 in. thick insulated units consisting of 1/4 in. thick, clear, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, float glass for the interior lite. Unit shall have a shading coefficient of 0.32, a visual light transmittance of 54 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

C. Type GL-2A: 1 in. thick insulated units consisting of 1/4 in. thick, clear, tempered, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, tempered, float glass for the interior lite. Unit shall have a shading coefficient of 0.32, a visual light transmittance of 54 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

D. Type GL-3: 1 in. thick insulated units consisting of 1/4 in. thick, clear, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, float glass for the

interior lite with 30 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.32, a visual light transmittance of 54 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

E. Type GL-3A 1 in. thick insulated units consisting of 1/4 in. thick, clear, tempered, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, tempered, float glass for the interior lite with 30 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.32, a visual light transmittance of 54 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

F. Type GL-4: 1 in. thick insulated units consisting of 1/4 in. thick, clear, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, float glass for the interior lite with 60 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.32, a visual light transmittance of 54 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

G. Type GL-4A 1 in. thick insulated units consisting of 1/4 in. thick, clear, tempered, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, tempered, float glass for the interior lite with 60 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.32, a visual light transmittance of 54 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

H. Type GL-5: 1 in. thick insulated, spandrel units consisting of 1/4 in. thick, CrystalGray, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, float glass for the interior lite. Unit shall have a shading coefficient of 0.26, a visual light transmittance of 39 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

I. Type GL-5A: 1 in. thick insulated, spandrel units consisting of 1/4 in. thick, CrystalGray, tempered, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, tempered, float glass for the interior lite. Unit shall have a shading coefficient of 0.26, a visual light transmittance of 39 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

J. Type GL-6: 1 in. thick insulated, spandrel units consisting of 1/4 in. thick, CrystalGray, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, float glass for the interior lite with 30 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.26, a visual light transmittance of 39 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

K. Type GL-6A: 1 in. thick insulated, spandrel units consisting of 1/4 in. thick, CrystalGray, tempered, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, tempered, float glass for the interior lite with 30 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.26, a visual light transmittance of 39 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

L. Type GL-7: 1 in. thick insulated, spandrel units consisting of 1/4 in. thick, CrystalGray, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, float glass for the interior lite with 60 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.26, a visual light transmittance of 39 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

M. Type GL-7A: 1 in. thick insulated, spandrel units consisting of 1/4 in. thick, CrystalGray, tempered, float glass with Low-E coating on surface 2; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, tempered, float glass for the interior lite with 60 percent white dot frit on surface 3. Unit shall have a shading coefficient of 0.26, a visual light transmittance of 39 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

N. Type GL-8: 1/4 in. thick, clear, float glass.

O. Type GL-9: 1/4 in. thick, acid etched, clear, tempered, float glass, SatinDeco by Guardian.

P. Type GL-10: 1/2 in. nominal thick laminated assembly consisting of 2 layers of 1/4 in. thick, clear, float glass with clear PBV interlayer 0.030 in. thick.

Q. Type GL-11: 1 in. insulated units consisting of 1/4 in. thick, clear, tempered, float glass with Low E coating on surface 2 and 1/4 in. thick FireLite fire rated ceramic glazing, FireLite IGU by Technical Glass Products. Unit shall be installed with fire rated glazing tape.

R. Type GL-12: 1 in. thick insulated units consisting of 2 layers of 1/8 in. thick, clear, heat-strengthened, float glass with clear PVB interlayer, with Low-E coating on surface 4; 1/2 in. dehydrated air space; and 1/4 in. thick, clear, heat-strengthened, float glass for the interior lite. Unit shall have a shading coefficient of 0.32, a visual light transmittance of 54 percent and a U-value of 0.29 similar to Sunguard SuperNeutral 54 by Guardian.

END OF SECTION

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SECTION 09250
GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Gypsum board.

2. Fasteners, joint reinforcing and finishing compound.

B. Related work:

1. Divisions 5 and 9 for metal framing supporting gypsum board.

2. Division 7 for gypsum underlayment board.

3. Division 8 for access panels in gypsum board surfaces.

4. Division 9 for gypsum board shaftwall systems.

5. Division 9 for gypsum sheathing board.

1.2 REFERENCES

A. ASTM C 475: Specification for Joint Compound and Joint Tape for Finishing Gypsum Wallboard.

B. ASTM C 840, Specification for Installation and Finishing of Gypsum Board.

C. ASTM C 954: Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch to 0.110 inch in Thickness.

D. ASTM C 1002: Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Stud

E. ASTM C 1396 Standard Specification for Gypsum Board

F. ASTM E 119: Test Method for Fire Tests of Building Construction and Materials

G. ASTM E 497, Installing Sound Isolating Lightweight Partitions.

H. GA-216, Application and Finishing of Gypsum Board.

I. GA 226, Application of Gypsum Board to Form Curved Surfaces.

1.3 SUBMITTALS

A. Data: Submit manufacturer's data for all materials to be used in gypsum board construction.

1.4 QUALITY ASSURANCE

A. Requirements of regulatory agencies:

1. Comply with fire resistance ratings indicated and required by Code.

2. Provide materials, accessories and application procedures listed by UL or tested in compliance with ASTM E 119 for the type of construction shown.

B. Mockup:

1. Where directed, construct a mockup of a gypsum board wall and ceiling inside the building. Make mockup full height (minimum 8 feet high by 8 feet wide) with a 4-foot return.

2. Tape and finish joints, trim and screw heads as specified for Level 5 herein. Refer to Section 09900 for painting of the mockup with a semi-gloss paint.

3. The Architect will review the mockup under various light conditions for defects and improperly finished joints, trim and screw heads. Provide a portable light for that purpose when so requested.

4. Make corrections requested by the Architect, or remove and replace mockup when the corrective work is not acceptable to the Architect.

5. The approved mockup shall remain in the building until its removal is directed, and will be used as a standard for the gypsum board work for the Project.

1.5 HANDLING

A. Procedure: In accordance with GA 801 "Handling Gypsum Board."

B. Storage: Do not overload the floors with localized concentration of gypsum board.

1.6 JOB CONDITIONS

A. Comply with the gypsum board manufacturer's recommendations and GA “Application and Finishing of Gypsum Board” for temperature limitations and ventilation before, during and after installation of gypsum board.

B. Protect installed materials from drafts during hot, dry weather.

C. Illuminate work areas during installation to provide the same or greater level of illumination required to properly perform the work and as will occur in the room or space after the building is in operation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. BPB America, Inc.

B. Lafarge Gypsum.

C. National Gypsum Co./Goldbond Building Products Division.

D. PABCO Gypsum.

E. Temple-Inland Co.

F. US Gypsum Co.

G. G-P Gypsum Products.

2.2 GYPSUM BOARD

A. General:

1. Provide boards complying with ASTM C 1396 as follows and in maximum lengths available to minimize end butt joints.

2. Unless otherwise acceptable to the Architect, no end-to-end butt joints are allowed on walls or ceilings less than 12-foot in length or width.

B. Exposed gypsum board surfaces (Type X): Provide boards with paper face suitable to receive decorative finish, and long edges tapered to receive joint compound.

1. Within 8 feet of floor, except in closets, provide abuse-resistant boards equivalent to US Gypsum Co. Fiberock VH1.

2. Water resistant gypsum board: “DensArmor Interior Guard” by Georgia Pacific, or equal, moisture- and mold-resistant panels with coated glass-mat facings, complying with ASTM C 36 and ASTM C 1177.

C. Flexible board for curved surfaces:

1. USG.Sheetrock Brand 1/4 inch Flexible Gypsum Panels (basis of design)

2. National Gypsum Co. High Flex Wallboard.

3. Lafarge Gypsum Flexboard.

4. Celotex Flextek.

D. Core board: One inch thick equivalent to USG Sheetrock Brand Gypsum Liner Panels or Gold Bond Shaftliner.

2.3 ACCESSORIES

A. Screws: The following sized in compliance with the gypsum board manufacturer's instructions and Code requirements.

1. ASTM C 954 for fastening to supporting studs and furring.

2. ASTM C 1002, Type G for gypsum board-to-gypsum board.

B. Metal trim: Galvanized steel of the types specified hereafter complying with ASTM C 1047.

1. LC-Bead: J-shaped; exposed long flange to receive joint compound; use at exposed panel edges.

2. L-Bead: L-shaped; exposed long leg to receive joint compound; use where indicated.

3. U-Bead: J-shaped; exposed short flange not to receive joint compound; use at exposed panel edges.

4. Expansion (Control) Joint: Use where indicated.

5. Control joint: USG No. 093 or Goldbond Building Products E-Z Strip.

C. Joint tape, compound and laminating adhesive: ASTM C 475, low or very low shrinkage, type recommended by the manufacturer, by Hamilton Materials, basis of design, Murco, or one of the gypsum board manufacturers.

1. Taping, and fastener and metal trim concealment: Red Dot Lite.

2. Topping, finish and skim coats: Green Dot Lite.

D. Sealants: As specified in Section 09820.

PART 3 - EXECUTION

3.1 EXAMINATION/PREPARATION

A. Examine conditions affecting the work of this Section at site.

B. Verify framing members straightness and alignment.

C. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

D. Before enclosing stud walls, thoroughly clean floor tracks of debris.

3.2 GYPSUM BOARD INSTALLATION - GENERAL

A. Comply with the applicable provisions of the references standards and the following.

B. Use only full size boards above door and window openings; joints at corners of heads are not acceptable.

C. Minimize butt joints and avoid butt joints centered on walls, over protruding studs, and above doors and windows. Avoid abutting end joints in the central area of each ceiling.

D. Install all panels, including those in non-rated applications, with joints in moderate contact.

E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back blocking is provided behind end joints.

F. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends.

1. Do not place tapered edges against cut edges or ends.

G. Stagger vertical joints over different studs on opposite sides of partitions.

H. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Attach gypsum panels to framing provided at openings and cutouts.

J. Except where frames are solidly grouted, spot grout hollow metal door frames. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.

K. Provide perimeter relief where board abuts structural decks, ceilings, vertical structural elements, or glazed assembly.

L. Install horizontal boards first. Butt joints between boards loosely. Do not force boards into place. Place tapered or wrapped edges next to one another.

M. Attach boards to all studs and furring members with power-driven screws securely engaging supporting member, and with fastener heads uniformly depressed not over 1/32-inch below surface of board (except for first layer of multiple layer assembly) without breaking face paper.

N. After boards have been installed over screws and backing plates, tap boards with a rubber mallet to depress backside of board over heads to eliminate unacceptable bulges.

3.3 SINGLE LAYER APPLICATION

A. Horizontal surfaces:

1. Install board with long dimension at right angle to supports, with end joints located over supports.

2. Use maximum practical length boards to minimize end joints. Stagger end joints in alternate boards.

B. Vertical surfaces: Unless otherwise acceptable to the Architect, install board vertically. Use floor-to-ceiling length boards (unless height exceeds 12-foot) with vertical joints located over supports.

1. At high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

2. Offset joints at least one stud on opposite sides of partition/walls.

3. Extend gypsum board continuously from finish floor to underside of structure above, except where indicated otherwise on the Drawings.

3.4 MULTIPLE LAYER APPLICATION

A. Vertical surfaces:

1. Install board vertically using floor-to-ceiling length boards (unless height exceeds 12 feet) with vertical joints located over studs.

2. Offset joints at least one stud spacing on opposite sides of partitions and between subsequent layers of gypsum board.

3. Fasten all layers of gypsum board to metal framing with screws.

B. Where gypsum board will be applied to curved surfaces, use multiple layers of 1/4 inch thick panels specified above.

1. Select board length and cut board to allow one unbroken board to cover curved surface and 12 tangents at each end.

2. Stack boards with wet surface facing each other for at least one hour and cover stack with a plastic sheet.

3. Install boards with long edge at right angle to framing on the convex side of the assembly and attach to support from one end to other; on the concave side start attaching the boards from the center to the edges.

4. Make cutouts for penetrations after the boards have dried in place, not before installation.

5. Completed installation shall present smooth, unbroken curves. Segmented surfaces are not acceptable.

3.5 ALLOWABLE TOLERANCES

A. Do not exceed 3/16 inch in 8 feet, and 1/8 inch in 4 feet from plumb, level and flat (all directions) in gypsum board surfaces.

B. Do not exceed 1/8 inch from geometry indicated for vaults and other curved surfaces.

C. Do not exceed 1/16 inch offset at joints between boards.

D. Shim boards as necessary to comply with these tolerances.

3.6 FINISHING

A. Finish gypsum board surfaces with exposed joints, corners and edges reinforced or trimmed in compliance with the following:

1. Level 0: Use for first layer of multiple layer construction and gypsum board ledge guards in elevator shafts.

a. No taping, finishing or accessories required.

2. Level 1: Use in plenum areas above ceilings, in attics, and in areas where the assembly will generally be concealed.

a. Joints and interior angles shall have tape embedded in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

3. Level 2: Use in storage and similar areas where surface appearance is not of primary concern.

a. All joints and interior angles shall have tape embedded in joint compound and one separate coat of joint compound applied over all joints, angles, fastener heads, and accessories. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

4. Level 3: Not used.

5. Level 4: Use in storage and similar areas where surface appearance is not of primary concern.

    a. Joints and interior angles shall have tape embedded in joint compound and apply 3 separate coats of joint compound over joints, angles, fastener heads, and accessories. Joint compound shall be smooth and free of tool marks and ridges.

6. Level 5 – skim coat (spray and roller-applied finish is not acceptable): Use for all other areas to be painted.

    a. Joints and interior angles shall have tape embedded in joint compound and 3 separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Apply a thin skim coat of joint compound, or one coat of gypsum board primer specified above to entire surface for a smooth surface free of tool marks and ridges, and matching approved mock-up.

B. General:

1. Fill joints, fastener heads, trim accessory flanges and surface defects with joint compound in compliance with the gypsum board manufacturer's recommendations to obtain a smooth, flush surface.

2. All joints, fastener heads and trim flanges in surfaces which will remain exposed to view in the building, shall be invisible after application of joint tape and compound.

3. Fill and finish gypsum board clad columns with a straightedge from corner bead to corner bead to eliminate concave surfaces between beads.

C. Install trim in single unjointed length, unless length exceeds manufacturer's standard. Attach to gypsum board in compliance with manufacturer's instructions.

1. Install Type CB trim at external corners.

2. Install Type LC trim where gypsum board edges are exposed in the finish work.

3. Install Type CB or LC trim where gypsum board abuts a different material, and the edges are not covered by a finish material.

4. Install control joints as recommended in paragraph 5.6 of the reference standard. Joint locations are subject to the Architect's approval.

D. Reinforce joints between gypsum boards, and interior corners and angles with tape set in joint compound.

1. Apply skim coat over tape in one application.

2. Where space greater than 1/16 inch occurs between abutting gypsum boards (except at control joints and for concealed layers of multiple layer assemblies), pre-fill joints with joint compound and allow to dry before applying joint tape.

E. Joint compound:

1. Lap each coat not less than 4 inches over the preceding coat (2 inches on each edge). Width of joint compound on tapered board edges shall be not less than 12 inches; width of joint compound on square board edges not less than 18 inches.

2. Allow at least 24 hours drying time between applications of joint compound.

3. Finish joint compound so that little or no sanding is required. When sanding, use sandpaper or mesh cloth with grit as fine as possible; do not scuff face paper. Remove all sanding dust before painting or applying other finishes.

F. Leave gypsum board surfaces smooth, undamaged and ready to receive scheduled finishes.

END OF SECTION

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SECTION 10250
HEADWALLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Patient services headwalls.

B. Related sections:

1. Medical gas and vacuum connections: Division 15.

2. Electrical and telephone connections: Division 16.

1.2 SUBMITTALS

A. Submit the following:

1. Product Data: Indicate physical dimensions, features, mounted anchorage details, and rough in measurements for utilities.

2. Manufacturer's Installation Instructions: Indicate special procedures requiring special attention.

1.3 COORDINATION

A. Coordinate the work with wall or partition sections for installation of concealed blocking or anchor devices.

PART 2 - PRODUCTS

2.1 DESCRIPTION/MANUFACTURER

~~A.Patient headwall system shall be UL listed, wall mounted cabinetry to support various back fed mechanical and electrical systems, as manufactured by Modular Services Company, (800) 687-0938, Models 6400 and 6600.~~

A. Contour Headwall System by Hill Rom with Med-Surg option, recessed, with back-fed mechanical and electrical systems, nurse call button. Color to be selected by Architect.

B. Single Patient Cogent Training Headwall by Hospital Systems Inc., surface mounted to support simulated oxygen, and other mechanical and electrical systems, non-functional nurse call button. Color to be selected by Architect.

~~2.2CONSTRUCTION~~

~~A.C. Casework: Constructed of 7 ply plywood and particleboard with plastic laminate.~~

~~2.3~~2.2 UTILITIES

A. Units shall be prewired with service connections terminating at the back of each unit. All wiring shall be done in accordance with UL requirements.

B. Electrical:

1. Provisions for low voltage communications devices shall consist of back boxes or barriered compartments.

2. Electrical devices are shown on the Drawings.

C. Medical gas:

1. Medical gas outlets shall be pre-manifolded using medical grade copper tubing and shall terminate at the top of each unit, requiring one service connection for each service per patient.

2. All tubing and fittings prior to manifolding shall be cleaned, rinsed and dried in accordance with NFPA 99. All joints shall be made with a silver brazing alloy with a melting point of at least 1000 deg. F. Tubing ends shall be securely capped and properly identified. Copper tubing shall be protected from contact with dissimilar metals.

3. Outlets type and style to be selected by District.

D. Vacuum bottle brackets shall be fixed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that rough-in for components are correctly sized and located.

3.2 INSTALLATION

A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.

B. Position top of headwalls as shown on the Drawings from finished floor.

C. Installation of utilities are specified in Divisions 15 and 16.

END OF SECTION

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SECTION 10705
SUNSHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Prefinished exterior aluminum sunshades.

2. Supplementary parts and components, such as inserts, clips, fasteners, anchors and other miscellaneous supports required for a complete installation.

B. Related work:

1. Division 8 for fins and sunshades on aluminum curtain wall.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

B. American Welding Society (AWS)

C. American Architectural Manufacturers Association (AAMA)

D. The Aluminum Association (AA)

1.3 PERFORMANCE REQUIREMENTS

A. Structural performance: Provide sunshades capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of sunshade components or permanent damage to fasteners and anchors. Wind pressures shall be considered to act on vertical projection of sunshades.

1. Wind Load Resistance: Provide components that are capable of with standing wind loads of up to 28 psf without damage.

B. Thermal movements:

1. Provide sunshades that allow for thermal movements resulting from the following change (range) in ambient and surface temperatures without buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

2. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

3. Temperature change (range) of 120-degree F, ambiant, 200-degree F, material surfaces.

1.4 SUBMITTALS

A. Data: Submit copies of manufacturer specifications, anchorage details and installation instructions, including specifications for finishing materials, dimensions of individual components, profiles and finishes.

B. Shop drawings: Submit the following.

1. Detail the fabrication and erection of sunshades not shown in the manufacturer data.

2. Include details of sections, connections and anchorage..

3. Show interface with adjacent materials, anchorage and accessories.

C. Samples: Submit 6-inch long finished samples of each profile of aluminum extrusions with the specified finish.

1.5 QUALITY ASSURANCE

A. Engineering:

1. The assemblies are design/build and the Contractor is responsible for the engineering, fabrication and installation of the sunshades and their connections to the structure within the physical limitations indicated on the Drawings.

2. Drawings and calculations for the sunshades shall be prepared by a California-licensed professional engineer.

3. Submit drawings and calculations to DSA for approval, and pay fees incurred thereby before start of installation.

4. Provide structural calculations prepared in compliance with referenced documents and these Specifications. Calculations shall be legible and shall incorporate sufficient cross references to shop drawings to make calculations readily understandable and reviewable. Test reports are not an acceptable substitute for calculations. Calculations shall include:

a. Analysis of framing members.

b. Analysis of anchors, including anchors embedded in concrete.

c. Section property computations for framing members.

d. Seal and signature of professional engineer.

5. Fasteners and connections are shown schematically.

a. Fasteners or connections shall not conflict with or require revision of the finish profiles of the sunshades or the supporting work.

b. Connections to the structural frame shall not impose any eccentric loading, or induce twisting or warping.

c. Connections to the structural frame shall be able to accommodate misalignment of the structure within limits allowed by the AISC tolerances.

B. Welding:

1. Qualify procedures and personnel according to AWS D1.2, ”Structural Welding Code-Sheet Aluminum”.

2. Examine that welders to be employed in this work have satisfactorily passed AWS qualification tests.

3. If recertification of welders is required, retesting will be Contractor's responsibility.

PART 2 - PRODUCTS

2.1 MANUFACTURE

A. ASCA Inc. (basis of design), Firestone UnaClad, Construction Specialties or equal.

2.2 MATERIALS

A. Aluminum blades and frame: ASTM B 221, 6063-T5 alloy and 6063-T6 for extrusions and ASTM B 209, 5052 H-32 or greater.

B. Fasteners: Stainless steel, 300 series, ASTM A-307, Grade A or better. Use Phillips flat-head machine screws for exposed fasteners.

C. Welding electrodes: As recommended by the aluminum producer and AWS.

D. Anchors and inserts:

1. Non-ferrous metal or hot-dip galvanized anchors and inserts.

2. Use steel or lead expansion bolt devices for drilled-in-place anchors.

3. Furnish inserts, as required, to be set into concrete and masonry.

2.3 FABRICATION

A. Tapered outrigger plates shall be fabricated of 5052-H32 aluminum plate, shaped as shown on Drawings.

B. Sunshade baffles shall be airfoil shaped 6063-T5 extruded aluminum, at a width of 1-1/2 in. and a depth of 6 1/2”, spaced and sloped as indicated on the Drawings.

C. Round tube fascia shall be 5-1/2 in. dia. 6063-T6 extruded aluminum.

D. Include supports, anchorage, and accessories required for complete assembly.

E. Finish sunshade assembly with a fluorocarbon resin coating, as specified in Section 05082.

1. ASC-1: Silversmith (Mica) 439RZ1541M Fluropon Classic II by Valspar.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine adjacent construction and supports.

B. Verify that substrate is within allowable tolerances, plumb, level, clean, will provide a solid anchoring surface and conditions detrimental to the proper and timely completion of this work are corrected before proceeding with installation.

3.2 INSTALLATION

A. Place sunshade level and in proper alignment with adjacent work within the following tolerances:

1. Variations from level: +/- 1/8" maximum in any column to column space or 20'-0" runs, non-cumulative.

2. Offsets in end-to-end or edge-to-edge alignment of consecutive members: 1/32 in.

B. Do not cut and trim component parts during erection without the approval of the manufacturer or the fabricator, and in accordance with his recommendations. Restore finish completely. Remove and replace members where cutting and trimming has impaired the strength or appearance of the assembly as directed.

C. Do not erect warped, bowed, deformed or otherwise damaged or defaced members. Remove and replace any members damaged in the erection process as directed.

D. Set units level, plumb, and true to line, with uniform joints. Form tight, flush joints with exposed connections accurately fitted together.

E. Anchor securely to adjacent construction as indicated on the approved shop drawings. Use concealed anchorages wherever possible.

F. Apply a bituminous coating of approximately 30 mils DFT, or other suitable permanent separator, on concealed contact surfaces and dissimilar materials, before assembly or installation, wherever there is a possibility of corrosive or electrolytic action.

END OF SECTION

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SECTION 11400
FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.01 WORK COVERED

A. The principle items of work included in this section are labor, material, tools, equipment, and transportation, and include:

1. Furnish and installation of all equipment as specified in equipment schedule.

2. Coordinating with work of other sections and providing support and accommodation of related work.

3. Work involved in making and installation of stands and supports for equipment, including backing plates in wall, except where specified otherwise or shown on drawings for specific items.

4. Cutting of all holes in equipment, including holes for pipes, drains, electrical outlets, required for this section. Work shall include welded sleeves, collars, ferrules or escutcheons.

5. Repair of all damage to building resulting from work of this section.

6. Furnish faucets, sink wastes, drain fittings, tail pieces and strainers for foodservice equipment.

7. Mechanical and electrical devices furnished for installation by others shall comply with requirements of mechanical and electrical sections.

1.02 RELATED WORK IN OTHER SECTIONS

A. All electrical, gas, steam, water and waste services to rough-in points at fixture locations and final connections to fixtures, except where specified otherwise for specific items.

B. All ventilating work and ducts above finished ceiling.

C. All concrete work, including curbs, gutters, raised bases, floor depressions, cement finishings and tile overlay, including cold storage room floors and cove bases.

D. Finish floor sealing or covering.

E. Color and pattern selection of paints, stains, and plastic laminate material.

1.03 BASE BID AND SUBSTITUTIONS

A. Base bid shall be for furnishing all equipment and material as specified. Failure to furnish bid exactly as specified may disqualify bidder. However, bidders may quote on substitute products by listing them on the substitution page of the bid form and by indicating the additional cost or credit. No later request for substitution will be considered.

B. Acceptance of proposed substitution is entirely at discretion of Owner or his Representative, and subject to the following qualifications:

1. Equal in quality of materials used, in structural strength and in details of construction.

2. Equal in performance, mechanically and productivity.

3. Equal in finish, or in characteristics permitting specified finish to be applied.

4. Availability of replacement parts and maintenance service.

C. The bid price for each proposed substitute shall include all money required to incorporate the substitute into the project. Later requests for additional monies for substitutes will not be considered.

D. Any variation or modification of ventilators shall be the sole responsibility of the Kitchen Equipment Contractor.

1.04 MODIFICATIONS/RESET OF EXISTING EQUIPMENT (IF ANY)

A. All equipment noted in the specifications as "Existing-Reset" shall be modified and relocated as specified shown on the drawings.

B. Bidders shall carefully examine the specifications and the project site including location and condition of existing equipment to determine cost for each "Existing-Reset" and "Existing-Modify" item to cover removal, modification (including materials), cleaning, inspection for damage, repair and resetting.

C. Each "Existing-Reset" item shall be clean, in good repair and operable when reset.

1.05 DRAWINGS

A. Drawings furnished constitute a part of these specifications. They show locations of equipment and the general arrangement of mechanical and electrical services. Necessary deviation from the illustrated arrangements to meet structural conditions shall be considered a part of the work of this section.

B. The drawings are for the assistance and guidance of the Contractor. Exact locations shall be governed by the building configuration.

C. Should there be a conflict between the drawings and the specifications, contact Laschober & Sovich, Inc., for clarification.

1.06 REGULATORY AGENCIES

A. All work shall be in accordance with the governing health, building and safety, and fire protection codes and regulations.

B. Standards of the National Sanitation Foundation (NSF) shall serve as guidelines for the work of this section.

C. All electric equipment and accessories shall conform to the standards of the National Electric Manufacturers Association (NEMA), California Electrical Code (CEC), Underwriters Laboratories, Inc. (UL) or the local Electrical Testing Station.

D. All gas-fired equipment and accessories shall conform to the standards of the American Gas Association (AGA).

E. All steam generating equipment and accessories shall conform to the standards of the American Society of Mechanical Engineers (ASME).

F. Rulings and interpretations of state and local enforcing agencies (S.C.A.Q.M.D. South Coast Air Quality Management District) shall be considered a part of the regulations and shall include fees for licensing of equipment and necessary signatures and notaries on foodservice drawings as may be required for approval.

G. The responsibility for obtaining applications and permits required by the S.C.A.Q.M.D. (South Coast Air Quality Management District) shall be the Owner's or Owner's representative.

H. Installation of all equipment to insure stability in seismic disturbances shall comply with:

1. Regulations in the most recent amended Section 45081 of Title 17 Public Health of Part 1 State Department of Health Chapter 8 Safety of Construction of Hospitals.

2. "Guidelines for Seismic Restraints of Kitchen Equipment" (Sheets 1-22) published by SMACNA and approved by the Office of Statewide Health Planning and Development (OSHPD).

1.07 MANUFACTURERS' INSTRUCTIONS

A. Manufacturers' directions shall be used in this contract covering points not shown or noted in the drawings or specifications.

1.08 MANUFACTURERS' LITERATURE

A. Submit seven bound sets of manufacturers' specifications and data sheets, describing articles and equipment, as specified, for approval.

1. Each submittal must show item number, units to be furnished, manufacturer's model number and list optional finish and accessories to be supplied. In addition, show electrical characteristics and BTU rating and indicate if electrical cord and plug will be furnished.

B. Bound submittals shall be complete, accounting for each specified "buy-out" (standard equipment) item. Loose sheets or "piecemeal" submittals shall not be acceptable. If a manufacturer's catalog sheet is not obtainable, for a specific item, insert a typewritten sheet describing the item giving all of the required information.

1.09 SHOP DRAWINGS

A. Prepare and submit one reproducible and two prints of preliminary shop drawings, showing all information necessary for fabrication and installation of the work of this section, for approval process.

1. Furnish 1/4 inch scale, dimensioned mechanical and electrical rough-in and raised concrete base drawings for all kitchen equipment including items listed as "Future", "By Owner", and "By G.C.", if any.

2. Furnish 3/4 inch scale elevation and 1 1/2 inch scale vertical cross section, dimensioned, drawings of fabrication details.

a. Show all materials, gauges, and methods of construction, including relation to adjoining and related work when cutting or close fitting is required.

b. Show all reinforcements, wall backing, anchorage and other work required for complete installation of all fixtures.

3. Reproductions of original Contract Drawings are not acceptable for use as shop drawing

submittals.

4. "Piecemeal" submittals of shop drawings shall not be acceptable.

B. Provide seven (7) prints of APPROVED shop drawings for final distribution only.

1.10 MAINTENANCE DATA AND OPERATING INSTRUCTIONS

A. Submit for approval, for Owner's use, three bound sets of operating and maintenance instructions containing complete description, wiring diagrams, operating data and other information pertaining to the proper operation and up-keep of the various items of mechanical equipment having motors or other moving parts.

1. Include names, addresses and telephone numbers of authorized service agencies, for all items with mechanical equipment.

2. Include complete warranty information including proof of warranty, number of years and any special conditions.

1.11 WARRANTIES

A. Equipment furnished for this foodservice facility shall be new and warranted for a period of one year, beginning on the date of final acceptance of the work of this section. Warranty shall protect against defective material, design and workmanship.

B. In addition to the above, all self-contained refrigeration equipment shall include in their warranty, installation, start-up and an additional, minimum four year extended warranty on sealed compressor/motor assemblies. The extended warranty shall include parts only.

C. Upon receipt of notice of failure of any part, during the warranted period, the affected part or parts shall be replaced promptly at no cost to the Owner.

D. In the event the replacement of an entire item is required, the Owner shall have the option of full use of the defective equipment until a replacement has been delivered and completely installed.

E. All repairs and replacements shall be made at a time and during hours satisfactory to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Metal

1. Stainless Steel: All new, first grade, material; U.S. Standard Gauges as specified or shown; 18-8, Type 304, No. 4 finish, ASTM A 167.

2. Galvanized Steel: All new, commercial quality, zinc coated carbon steel; U.S. Standard Gauges as specified or shown, ASTM A 526.

3. Steel Pipe: All new, commercial quality, galvanized; rust resistant coating on threads.

B. Wood

1. Plywood: All new material; thickness as specified; waterproof glued, Marine grade. (Particle board not acceptable).

2. Hardwood: Birch, kiln dried, clear stock sizes.

3. Construction Lumber: Douglas fir, commercial construction grade, select.

   a. "Wolmanize" where in contact with concrete or masonry.

C. Plastic Laminate

1. Shall be as manufactured by one of the following:

   a. Formica, Nevamar, Textolite, Micarta, Consoweld, Wilsonart, unless specified otherwise.

2. Horizontal surfaces, standard grade 1/16 inch thick.

3. Vertical surfaces, standard 1/32 inch thick.

4. Curved surfaces, where 1/16 inch or 1/32 inch is impractical, use post forming grade, 0.050 inch thick.

5. Backing sheet, 0.025 inch thick, or reject 1/16 inch or 1/32 inch thick.

D. Hardware

1. Locks

   a. All metal cabinet doors and drawers, shall be furnished with Component Hardware cylinder locks Model P30-4760, Model P30-4770, or equal, all keyed alike unless specified otherwise.

   b. All wood cabinet doors and drawers, shall be furnished with Component Hardware cylinder locks Model P30-4760, or equal, all keyed alike unless specified otherwise.

   c. All refrigerated and heated cabinets of the reach-in and roll-in type shall be furnished with heavy-duty cylinder locks, on all doors, all keyed alike unless specified otherwise.

2. Catches

   a. For all cabinet doors, shall be Component Hardware Model M30-5920 self-aligning Magnetic, or equal, unless specified otherwise.

3. Door and Drawer Pulls

   a. For metal cabinet doors and drawers shall be stainless steel recessed type, Component Hardware Model P62-1014, or equal, unless shown or specified otherwise.

   b. For metal sliding doors, shall be stainless steel recessed type Component Hardware Model P62-1014, or equal, unless shown or specified otherwise.

   c. For wood cabinet doors and drawers provide an allowance for pulls to be selected by Interior Design, unless specified otherwise.

4. Hinges

   a. For metal cabinet doors, shall be heavy-duty concealed pivot hinge of stainless steel or cadmium plated, unless shown or specified otherwise.

b. For wood cabinet doors, shall be heavy-duty concealed pivot hinge finished to harmonize with cabinet finish unless shown or specified otherwise.

5. Casters

a. Shall be heavy-duty, bright zinc or chrome plated, ball-bearing type with greaseproof rubber, neoprene or polyurethane tires. Wheels shall be 5 inches diameter with minimum width treads of 1 1/8 inches and minimum capacity of 250 lb.'s per caster. Furnish with rubber donut bumpers and wheel brakes.

6. All hardware shall be identifiable for manufacturer.

E. Plumbing Fixtures

1. Faucets

a. Deck mounted mixing faucet assemblies shall be Fisher Model 3511 with 8 inch swing nozzle, 4” center, and non splash aerator, or equal, unless specified otherwise.

b. Splash mounted mixing faucet assemblies for pot sinks shall be Fisher Model 5414 with 14 inch swing nozzle, 8” center and 3/4” nozzle, or equal, unless specified otherwise.

c. Splash mounted mixing faucets for preparation and utility sinks shall be Fisher Model 3252 with 10 inch nozzle, 8” center and non splash aerator, or equal, unless specified otherwise.

d. Single filler faucets when specified or shown for hot food units, Bain maries, and steam tables, shall be Fisher Model 3011with 8 inch swing spout and non splash aerator, or equal, unless specified otherwise.

e. All faucet assemblies shall be polished chromium plated.

2. Waste Valves

a. For pot sinks – Valve shall be Fisher Model 22322 (rotary style) with flat stainless steel strainer and one piece overflow, or equal, unless specified otherwise.

b. For utility sinks in open bodies – Valve shall be Fisher Model 22330 (rotary style) with basket strainer and one piece overflow, or equal, unless specified otherwise.

c. For sinks in cabinet bodies with doors – Waste drain shall be Component Hardware Model E40-4895 with stainless steel basket strainer and one piece overflow, or equal.

3. Pre-Rinse Assemblies

a. Splash mounted pre-rinse assemblies shall be Fisher Model 2210-1WB with wall bracket and in-line dual check valve, or equal, unless specified otherwise.

b. Deck mounted pre-rinse assemblies shall be Fisher Model 2110-1WB with wall bracket and in-line dual check valve, or equal, unless specified otherwise.

c. All pre-rinse assemblies shall be polished chromium plated.

4. Scrapping Troughs

   a. Furnish water inlet fitting and control valve as part of all scrapping troughs ready for final connection. Furnish Fisher Model 2906 (or equal) Water Inlet Fitting with chrome plated control valve indexed "cold".

5. All plumbing fixtures shall be identifiable for manufacturer.

6. Furnish all built-in mechanically cooled water chillers and ice cooled cold plates with interconnecting insulated pipe between units and faucets installed and ready for final connection.

F. Heating Equipment

1. Furnish all built-in gas and electric heating equipment as complete systems, in size and rating specified, ready for final connection.

   a. All controls shall be readily accessible.

   b. All equipment shall be readily cleanable or easily removable for cleaning.

2. Furnish thermostatic controls and low water protection on all gas and electric heated ware-washer and utensil washer tanks.

3. Furnish thermostatic controls on all gas heated appliances other than open burner units, hot plates, hot tops, and broilers, unless specified otherwise.

4. Furnish all built-in steam heating equipment as complete systems, including valves, strainers, steam traps, gauges and pressure regulators in size or rating specified ready for final connection.

   a. All control valves, gauges and safety valves shall be readily accessible.

   b. All steam traps and check valves, shall be accessible.

5. Furnish all buy-out steam operated equipment with necessary pressure regulators, traps and valves, etc., for final connection.

G. Electrical

1. Furnish a control switch and starter with overload protection for each motor driven appliance and electrical heating unit, unless specified otherwise.

2. Furnish and install all electrical devices, including hood lights unless specified otherwise, and do all internal wiring of electrical apparatus built into or forming an integral part of fabricated equipment, complete to a J-box or breaker panel, as shown on plans, ready for final connection.

3. Furnish cord and plug for all mobile and portable equipment operating on 120 volt or 208 volt single phase power supply, unless specified, or indicated otherwise.

   a. Cord to be rubber covered, three wire of proper current capacity; furnish appropriate length.

   b. Plug to be three prong, ground type of proper NEMA configuration. (Verify for matching receptacle).

4. Where pedestal type service fittings are required, furnish T & S Model B-1508 or Model B-1518 (polished aluminum) with appropriate receptacle and satin stainless steel cover plate.

5. Furnish and install all fluorescent and incandescent fixtures, with lamps, when specified or shown on the drawings. Light switches (unless a part of a fixture) shall be furnished and install by the Electrical Contractor.

H. Mechanical

1. Furnish and install all stainless steel ducts, stacks and vents to finished ceiling connections from hoods, ventilators, ovens and other appliances furnished by this section. Make final connection including installation of stainless steel trim at ceiling connection.

2. The flue risers of broilers, griddles, fryers, and other equipment furnished by this section, shall be verified for proper venting.

3. All equipment heights shall be verified for clearance under ceilings, beams, pipes, and all exhaust devices including, hoods and ventilators.

4. Any variation or modification of ventilators shall be the sole responsibility of the Kitchen Equipment Contractor.

5. In the event of construction modifications that would cause a deviation in the height of the ventilators and therefore affect the clearances between the ventilators and the cooking equipment, it shall be the sole responsibility of the KEC (Kitchen Equipment Contractor) to notify all parties involved prior to the installation of the ventilators.

2.02 METAL FABRICATION

A. General

1. Custom fabricated items shall be fabricated by one manufacturer in an approved manner acceptable to Owner and Laschober & Sovich, Inc.

2. Weld all top, splash, sink and panel construction, of 18 gauge or heavier, into uninterrupted integral units.

   a. All seams and joints shall be shop welded where possible.

   b. All exposed stainless steel to have No. 4 finish.

3. Grind and polish all welds on stainless steel, with finish abrasion marks running longitudinally, to a No. 4 finish.

4. Grind smooth welds on galvanized steel and restore coating with Allstate No. 321 Galvanizing Powder or equal.

5. Conceal fasteners where possible; cap exposed bolts, nuts and pipe ends.

   a. Use non-corrosive material.

6. Use 1 5/8 inch, 16 gauge stainless steel tubing for all legs, tubular supports and cross rails unless shown or specified otherwise.

   a. Furnish stainless steel foot insert and leg socket for mounting each leg.

      (1) Component Hardware Model A10-0851 foot insert, or equal.

      (2) Component Hardware Model A18-0406 leg socket, or equal.

   b. Furnish 6 inch high cabinet base legs, including foot.

      (1) Component Hardware Model A84-5048 cabinet base leg, or equal.

7. For metal top tables, weld gussets to 14 gauge hat sections, or open channels.

8. Fully weld all cross rails to legs 10 inches above floor, grind smooth and polish.

9. Legs without shelves or cross rails shall have 1/2 inch O.D. stainless steel pin for anchoring to floor.

B. Tops

1. Table tops, drainboards, counter tops, splashes and extensions shall be constructed of 14 gauge stainless steel, unless shown otherwise.

2. All tops with turned up rolled edge shall be reinforced with 14 gauge stainless steel closed hat sections, or open channels, spaced 30 inches O.C. or less, fastened to threaded studs, welded to underside of top, with acorn nuts.

3. All tops with turned down rolled edge shall be reinforced with 14 gauge closed hat sections or open channels, spaced 30 inches O.C. or less, fastened to threaded studs, welded to underside of top, with acorn nuts.

4. All hat sections shall be sealed to underside of tops with pad of 3M-1000 sealant.

5. Raised rolled edges shall have a roll diameter of 1 1/2 inches. Corners shall be bull nosed.

6. Inside radius bends, wherever horizontal and vertical surfaces intersect, shall be 9/16 inches.

7. All drainboard surfaces shall pitch toward drainers scrapping troughs, dishwashers and sinks.

8. Tops shall be turned down no less than 1 inch into openings for ice bins; and a 1/4 inch minimum raised embossment shall be provided on horizontal surface of top around entire perimeter of opening.

9. All openings for exposed foods shall be provided with 1/4 inch minimum raised embossment on horizontal surface of top around entire perimeter of opening.

C. Sinks

1. Sinks that are integral with drainboards shall be fabricated and constructed of same gauge and material as drainboard and splash.

2. Sinks that are integral with table or counter top may be fabricated or die formed.

   a. Fabricated sinks shall be of same gauge and material as top.

   b. Die formed sinks shall be not less than 18 gauge stainless steel.

3. All interior vertical and horizontal corners shall be coved.

4. Partitions between adjacent sink compartments shall be one inch apart joined with continuously welded radius top closure.

5. Exterior front of multiple compartment sinks shall be continuous.

6. Bottom of all sink compartments shall be pitched to insure complete drainage to waste opening.

D. Cabinets

1. Fabricate all visible parts of counter cabinets of 18 gauge stainless steel, unless shown otherwise, reinforced with formed steel sections, welded throughout to form a one-piece box-like structure, including front rails and mullions.

E. Drawers

1. Furnish all-welded 14 gauge stainless steel drawer front and interlocking channel supports, with large ball-bearing wheel suspension and stops; shall be easily removable; recessed stainless steel drawer pulls; 18 gauge stainless steel die-formed, easily removable, drawer bowl.

   a. For drawers mounted on underside of open tables, furnish 18 gauge stainless steel enclosure on sides and rear. Furnish with keyed cylinder lock.

   b. For drawers in refrigerated units, furnish large ball-bearing wheels and large flat track bearing surfaces; wheels and bearings of corrosion resistant, long wearing material, grease packed before assembly. Drawers shall be self-closing with easily removable drawer pans, perforated on all sides.

F. Doors

1. Furnish double cased steel doors, unless specified otherwise; 18 gauge stainless steel outer pan with corners welded, ground smooth and polished; 20 gauge stainless steel inner pan fitted tightly into outer pan with sound deadening material, such as Celotex, used as a core; tack weld pans together and fill seams with Dow Corning No. 732, or equal, silicone rubber sealant; finished door shall be approximately 3/4 inches thick and furnished with recessed Component Hardware P62-1014 pull.

   a. Reinforce and stiffen with closed hat sections, single pan type doors, when specified.

2. Flush mount sliding doors; suspend with large ball-bearing quiet rollers in 14 gauge stainless steel overhead tracks; made easily removable.

3. Flush mount hinged doors.

G. Shelves

1. All wall mounted shelves, elevated shelves and undershelves with open leg bases shall

be constructed of 16 gauge stainless steel, unless shown otherwise.

2. Unless shown otherwise, wall mounted shelves shall be die-rolled down 1 1/2 inches at front and ends, and turned up 2 inches at back and flared. Shelf shall be mounted on 14 gauge stainless steel brackets and anchored securely to wall.

3. Elevated and undershelves shall be as detailed. Where rolled edges are indicated, they shall be die-rolled down 1 1/2 inches. Elevated shelf supports shall extend below table or counter tops and be securely attached to structural frame.

4. Shelf and flange of undershelf with open leg base shall be notched a full 90 degrees, with radius to match leg. Flange shall be welded to leg from back side, 10 inches above floor.

5. Shelves in cabinet bases shall be constructed of 18 gauge stainless steel, unless shown otherwise.

6. Unless shown otherwise, shelves in cabinet bases shall be formed with minimum 2 inch turn-up at back and sides and feathered to insure a tight fit to enclosure panels and shall be turned down at front.

   a. Bottom shelves shall be removable unless shown otherwise.

H. Ducts

1. Verify size and position of all exhaust duct connections required for hoods, ventilators, washers and appliances; furnish and install 16 gauge stainless steel all welded ducts to ceiling connection locations. Welds on seams shall be continuous. Grind and polish welds to a No. 4 finish. Include stainless steel duct collar at exposed connection. Provide 3M duct wrap for exhaust ducts connected to hoods.

I. Undercounter Refrigerators

1. Outer casing shall be constructed of 18 gauge stainless steel, inner liner shall be of 20 gauge stainless steel with #2B finish unless shown otherwise.

2. Refrigerator shall be fully insulated with 2 inch minimum thickness of urethane or styrofoam between outer casing and inner liner at top, bottom and sides including doors.

3. Entire perimeter of door opening shall be faced with a 1/8 inch black bakelite thermal breaker strip approximately the width of mullion. Breaker strip at door sill shall be faced with 16 gauge stainless steel.

4. Door shall be constructed with 18 gauge stainless steel outer casing and 20 gauge stainless steel, #2B finish, inner lining, unless shown otherwise, molded grey vinyl latex door gasket shall be attached to perimeter of doors with concealed fasteners.

5. Drawer fronts shall be of same materials as specified for doors. Insulation shall be of same material as used in refrigerator walls and shall be a minimum of 1 inch in thickness. Unless shown otherwise, drawers shall be provided with Component Hardware Model P62-1014, or equal, flush style pulls.

6. All refrigerators shall be furnished with one 40 watt incandescent appliance light bulb and socket for each mullion connected in parallel with automatic door switch mounted in each door opening; full set of Kason No. 65 with No. 66 shelf clip bracket, or equal, stainless steel, removable adjustable pilaster standards for shelves for each refrigerator opening; two heavy-duty chrome plated wire shelves per compartment; one exterior reading, flush mounted dial type thermometer with -40 to +60 degree F. range.

7. All electrical wiring, including service for built-in evaporator coil fan shall be run in flexible conduit within refrigerator walls and shall terminate in external J-box mounted on end or rear of refrigerator cabinet in an accessible location for final connection.

8. Hardware for doors shall be Kason Model 218 self-closing edgemount hinge and Kason Model 171C, cylinder-locking, edgemount, magnetic latch, or equal, (all locks keyed alike).

9. All undercounter refrigerators shall be furnished with 20 gauge stainless steel box to house expansion valve located in base of fixture housing refrigerator or other concealed but accessible location.

10. Where cut-outs in refrigerator tops are specified or shown on detail drawings, raw edges of cut metal and insulation shall be covered with stainless steel sleeve. Counter top shall be turned down into opening to overlap sleeve with thermal barrier installed between. A stainless steel expanded metal guard shall be furnished for the full length and width of opening with sides attached to underside of refrigerator interior with closed bottom of guard located 6 1/2 inches below counter top.

J. Ice Bins and Cold Pans

1. Inner lining shall be constructed of 18 gauge stainless steel and outer casing shall be of 18 gauge galvanized iron, unless shown otherwise.

2. All ice bins and cold pans shall be fully insulated with 2 inch minimum thickness of urethane or styrofoam between outer casing and inner liner.

3. Ice bins and cold pans shall be isolated from tops of supporting fixtures by means of thermal barrier.

4. Furnish 16 gauge stainless steel perforated false bottom raised one inch above bin or pan bottom.

5. Furnish one inch drain and extend to floor sink.

K. Wall Flashing

1. Wall flashing shall be of 20 gauge stainless steel affixed to wall with heavy-duty, heat-resistant adhesive.

2. Flashing shall be fabricated from maximum width sheets for minimum amount of vertical joints and shall be sealed with silicone and capped with one-inch wide "T" molding, without exposed screws or fasteners.

3. When wall flashing includes capping of wall ends, capping shall be fabricated from 16 gauge stainless steel.

2.03 WOOD AND LAMINATED CONSTRUCTION

A. General

1. Wood fixtures included under this section shall comply with the requirements of the drawings, and the following listed standard specifications.

a. Manual of Millwork (latest edition), issued by Woodwork Institute of California (WIC), 1833 Broadway, P.O. Box 11428, Fresno, California 93773.

b. Specification Guide for Cabinet and Fixture Work, (latest edition), issued by the Cabinet and Fixture Manufacturers' Guild, 1225 Post Street, Mezzanine, San Francisco, California 94109.

2. Wherever laminated plastic materials are specified for cabinet work, counter or top facing, they shall be veneered with Urea Based cement, and shall be waterproof and heatproof. Rubber based adhesives are not acceptable. Top sheets shall be placed on and over finished edges.

3. Selection of all colors, pattern, laminates, paint, stain and varnish shall be made by the Architect.

B. Interior Finishes

1. Finish all interior surfaces of cabinets, including shelves and drawers as follows: (except when specified otherwise).

a. Cabinets: Stain to match exterior finish of cabinets; finish with one coat of clear plastic varnish.

b. Shelves: Stain to match exterior finish of cabinets; finish with two coats of clear plastic varnish.

c. Drawers: Finish inside and outside with one coat clear plastic varnish.

d. Doors and Panels: When exterior and edges are of plastic laminate, apply plastic laminate backing sheet and finish doors with one enamel coat to match exterior color.

(1) Omit enamel finish on sliding doors with plastic laminate backing.

PART 3 - EXECUTION

3.01 UTILITIES, STORAGE AND SPECIAL HANDLING

A. It shall be the Equipment Contractor's responsibility to determine whether the General Contractor will furnish and provide temporary power and light, openings and storage space to permit scheduled delivery of equipment.

B. The Equipment Contractor shall verify door openings, passages and conditions at the building. All special handling equipment charges shall be paid by the Equipment Contractor.

3.02 CONDITIONS AND PREPARATION

A. Verify all pertinent dimensions of the building and examine conditions affecting proper execution of this section. Evaluate access to various areas for moving in of equipment, and coordinate with General Contractor.

B. Verify water pressures and furnish necessary reducing valves.

C. Inspect flooring and raised concrete bases, wall finishes; verify existence of required mechanical and electrical rough-in; check painting, ceiling installation and all related work for readiness to receive installation of kitchen equipment.

D. Coordinate with the project superintendent as to the proper sequence for installation of equipment and wall finish.

E. Sweep clean all floor areas and tops of raised concrete bases before setting equipment in place; remove any spillage of foreign matter.

3.03 EQUIPMENT CONNECTIONS

A. Equipment shall be complete with connection terminals as standardized by equipment manufacturers, except where specified otherwise, for others to make plumbing, electrical, ventilation and refrigeration connections.

B. Indirect waste lines for buy-out and fabricated items, except sinks, shall be furnished and extended to drain location by the Kitchen Contractor. Indirect waste lines shall be hard copper tubing, wrapped with insulating tape when extended from ice storage bins, ice bins or other equipment when "sweating" may occur.

C. All exposed utility lines, valves, gauges, tubing, and conduit including mounting brackets, shall be chrome plated, stainless steel or sheathed in stainless steel.

3.04 TRIMMING AND SEALING EQUIPMENT

A. All gaps, joints and seams between fixtures and walls, ceilings and floor shall be completely closed and sealed with stainless steel trim strips, welding, silicone (Dow Corning No. #784 or equal), or epoxy sealant.

1. Sealant is not permissible in joints or seams which exceed 3/16 inch width.

2. Wood fixtures shall be scribed to exactly fit floor and wall surfaces and shall not be shimmed. Tops are to be installed level and securely fastened to bases.

B. All hollow sections shall be sealed.

C. All exposed ends of back-splashes shall be capped with stainless steel, welded, ground smooth and polished.

D. Fixtures resting on concrete bases shall be set into a mastic bed to eliminate crevices between fixture and base, and caulked after installation has been completed.

E. Where applicable, ends of all fixtures, splash backs, and shelves, shall be finished flush to walls or adjoining fixtures.

3.05 CLEANING

A. All debris, crates, and packages resulting from this work shall be removed from the premises or to area designated by the project superintendent.

B. All foodservice equipment shall be cleaned and ready for use when the structure is turned over to the Owner.

1. Protection of completed and cleaned work shall be the responsibility of the Equipment Contractor.

2. Include all existing-reset equipment, if any, as listed in the specifications.

3.06 ADJUSTMENT OF EQUIPMENT AND DEMONSTRATION

A. Turn on all mechanical equipment, test for leaks, poor connections, inadequate or faulty performance and correct if necessary; adjust for proper operation.

1. All thermostatically controlled equipment and equipment with automatic features shall be operated for a sufficient length of time to prove controls are functioning as intended.

B. At a time and date, selected by the Owner, the Equipment Contractor shall arrange for a demonstration of all mechanical equipment for the Owner and his appointed representatives, to be conducted by representatives of the various equipment manufacturers, with the Equipment Contractor in attendance.

PART 4.00 - EQUIPMENT

4.01 EQUIPMENT LIST – SEE DRAWINGS FOR QUANTITIES

ITEM NO. 1.1 VENTILATOR, EXHAUST

Manufacturer: GEMINI

Model Number: ~~WCBD-FL250 905122.5~~ WCBD-FL200 875122.5

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- See Drawings K0-9.01 thru ~~K0-9.06~~ K0-9.15
- Stainless steel enclosure panels
- Incandescent light fixtures
- Pre-piping for Pryro-Chem System

ITEM NO. 1.2 FIRE SUPPRESSION SYSTEM

Manufacturer: PYRO-CHEM

Model Number: KITCHEN KNIGHT II

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- See Drawings K0-9.01 thru ~~K0-9.06~~ K0-9.15
- Kitchen Knight II components
- Installation
- Discharge test
- Permit fee
- Remote pull switch
- Wall mount unit
- UL Listing EX-3830

ITEM NO. 1.3 WALL FLASHING, STAINLESS STEEL

Manufacturer: CUSTOM FABRICATION

Description Size and shape as indicated on plans, details and per Part 2.

ITEM NO. 1.4 RANGE, (2) O.B./ GRIDDLE W/ CONVECTION OVEN

Manufacturer: JADE

Model Number: JTRH-18GT-2-36C

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- Rear gas connection
- Cap and cover manifold at left and right sides
- 36 in. long quick disconnect hose

ITEM NO. 1.5 COOKTOP, DROP-IN, ELECTRIC

Manufacturer: GE

Model Number: PP980SMSS

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification.

ITEM NO. 1.6 COUNTER W/ SINKS/ FAUCET

MILLWORK – REFER TO ARCHITECTURAL DRAWINGS

At A.D.A compliant counter furnish in accord with manufacturer's standard specification and include the following:

- (1) Elkay LRAD(Q)3322554 with 5 in. depth
- Hole drilling configuration #3
- (2) Elkay LK99 drain basket assemblies
- (1) Advance Tabco K-58 swing spout with spray faucet assembly and wrist handles

ITEM NO. 1.7 DISPOSER

Manufacturer: IN-SINK-ERATOR

Model Number: LC-50

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification.

ITEM NO. 2.1 DISHWASHER, UNDERCOUNTER

Manufacturer: GE

Model Number: PDW9980NSS

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification.

ITEM NO. 2.2 CABINET, WALL MOUNT

Description: MILLWORK – REFER TO ARCHITECTURAL DRAWINGS

ITEM NO. 3.1 OVEN, MICROWAVE

Manufacturer: AMANA

Model Number: ALD10T

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification.

ITEM NO. 3.2A VENTILATOR, EXHAUST

Manufacturer: GEMINI

Model Number: WCBD-FL250 1235122.5

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- See Drawings K0-9.01 thru ~~K0-9.06~~ K0-9.15
- Stainless steel enclosure panels
- Incandescent light fixtures
- Pre-piping for Pryro-Chem System

ITEM NO. 3.2B VENTILATOR, EXHAUST

Manufacturer: GEMINI

Model Number: WCBD-FL250 1235122.5

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- See Drawings K0-9.01 thru K0-9.06
- Stainless steel enclosure panels
- Incandescent light fixtures
- Pre-piping for Pryro-Chem System

ITEM NO. 3.3 FIRE SUPPRESSION SYSTEM

Manufacturer: PYRO-CHEM

Model Number: KITCHEN KNIGHT II

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- See Drawings K0-9.01 thru ~~K0-9.06~~ K0-9.15
- Kitchen Knight II components
- Installation
- Discharge test
- Permit fee
- Remote pull switch
- Mount at left-end of item #3.02A
- UL 300 Certification

ITEM NO. 3.4 WALL FLASHING, STAINLESS STEEL

Manufacturer: CUSTOM FABRICATION

Description: Size and shape as indicated on plans, details and per Part 2.

ITEM NO. 3.5 KETTLE, 20 GALLON, TILT, FLOOR

Manufacturer: CLEVELAND

Model Number: KET20-T

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- Lift-of cover
- Double pantry faucet with swing spout and mounting bracket
- 208-Volt/3-Phase electrical service
- Kettle markings

ITEM NO. 3.6 FLOOR TROUGH AND GRATE

Manufacturer: DURAY

Model Number: FT-1 18"x27"

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification.

ITEM NO. 3.7 FRYER ASSEMBLY

Manufacturer: FRYMASTER

Model Number: H55-SC

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- Battery manifold of three fryers, single-point gas connection
- Frypot covers
- 36 in. long quick disconnect hose

ITEM NO. 3.8 STEAMER, ELECTRIC, 1-SECTION

Manufacturer: CLEVELAND

Model Number: 22-CET-3A

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- 34 in. high equipment stand
- 208-Volt/3-Phase electrical service

ITEM NO. 3.9 CABINET, FREE-STANDING

Manufacturer: CUSTOM FABRICATION

Description: Size and shape as indicated on plans, details and per Part 2.

ITEM NO. 3.10 OVEN, CONVECTION, ELECTRIC, 2-SECTION

Manufacturer: GE

Model Number: PT956SMSS

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification.

ITEM NO. 4.1 VENTILATOR, EXHAUST

Manufacturer: GEMINI

Model Number: ~~WCBD-FL250-484122.5~~ WCBD-FL200 454222.5

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- See Drawings K0-9.01 thru ~~K0-9.06~~ K0-9.15
- Stainless steel enclosure panels
- Incandescent light fixtures
- Pre-piping for Pryo-Chem System

ITEM NO. 4.2 FIRE SUPPRESSION SYSTEM

Manufacturer: PYRO-CHEM

Model Number: KITCHEN KNIGHT II

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- See Drawings K0-9.01 thru ~~K0-9.06~~ K0-9.15
- Kitchen Knight II components
- Installation
- Discharge test
- Permit fee
- Remote pull switch
- Wall mount unit
- UL Listing EX-3830

ITEM NO. 5.1 SINK ASSEMBLY W/FAUCETS/SOAP DISPENSERS

Manufacturer: JUST MANUFACTURING COMPANY

Model Number: JRLA-60-24-S

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- JSL-300-B, battery holder

ITEM NO. 5.2 PAPER TOWEL DISPENSER

Manufacturer: SAN JAMAR

Model Number: T14900TBK

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification.

ITEM NO. 6.1 REFRIGERATOR, REACH-IN, 2-SECTION

Manufacturer: UTILITY

Model Number: R-60-SA-SS-D

Specifier ID No. L022

Description: Furnish in accord with manufacturer's standard specification and with the following:

- 6 in. seismic legs.

ITEM NO. 6.2	FREEZER, REACH-IN, 2-SECTION
Manufacturer:	UTILITY
Model Number:	F-60-SA-SS-D
Specifier ID No.	L022
Description:	Furnish in accord with manufacturer's standard specification and with the following: • 6 in. seismic legs.

ITEM #F.1 THRU #F.6, #F2.1, #F2.2, #F4.1 AND #4.2 ARE FUTURE EQUIPMENT AND NOT PART OF THE EQUIPMENT SCOPE.

END OF SECTION

SECTION 11450
RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Residential appliances.

2. Supplementary parts and components, and supports required for a complete installation.

B. Related work:

1. Divisions 15 and 16 for electrical power, ventilation, water supply, and waste lines for appliances specified herein.

1.2 SUBMITTALS

A. Data: Manufacturer's data for items specified herein, including wiring diagram and power requirements.

B. Warranties and operating instructions: Manufacturer’s warranties and operating instructions for appliances.

1.3 QUALITY INSURANCE

A. All similar appliances shall be of one make.

1.4 MAINTENANCE

A. Furnish the District appliance manufacturer's warranties, operation and maintenance instructions, and spare parts.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. General: Except as noted, color(s) will be selected by the Architect from the manufacturer's standard palette.

B. Electric cooktop: 36 in. wide cooktop with ceramic glass cooktop and 5 ribbon heating elements, stainless steel, GE Profile, JP980SKSS by General Electric.

C. Dishwasher: Undercounter dishwasher, stainless steel, PDW9980NSS by General Electric.

D. Microwave oven: Countertop model with stainless steel interior and exterior, 1000 watts with 4 power levels, 1.2 cu. ft. capacity, ALD10T by Amana.

E. Ovens: 30 in. wide, convection and thermal, double wall ovens, stainless steel, GE Profile, PT956SMSS by General Electric. All controls shall be in front.

F. Refrigerator: Side by side refrigerator to be selected.

G. Washer: ~~Front loading washer to be selected.~~ Front loading clothes washer with 3.3 cu. ft. stainless steel wash tub, ADA compliant front controls, 8 wash cycles, Model CTSAOA by Speed Queen. The washer shall be Energy Star qualified.

H. Dryer: ~~To be selected.~~ Front loading, gas, clothes dryer with 7 cu. ft. drum, ADA compliant front controls, 4 dry cycles, Model CGS68 by Speed Queen.

PART 3 - EXECUTION

3.1 EXAMINATION/COORDINATION

A. Examine conditions and measurements affecting the work of this Section at site.

B. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

C. Coordinate installation of residential appliances with the work of related trades for necessary rough-in work, backing, supports and anchorage.

1. Deliver backing and embedments, including templates and instructions for their installation, to affected trades before related construction begins.

3.2 INSTALLATION

A. Install appliances in compliance with their manufacturer's instructions and recommendations plumb, level and secured to their supports.

B. Connect, test and adjust each appliance to ensure that they function properly, as intended.

END OF SECTION

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SECTION 12610
FIXED AUDIENCE SEATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Fixed audience seating for Planetarium.

2. Supplementary parts and components such as inserts, clips, fasteners, anchors, bracing, and other miscellaneous supports and accessories required for a complete installation.

1.2 ACCESSIBILITY REQUIREMENTS

A. Fixed seating for areas of public assembly shall comply with all of the seating requirements of CBC Section 1104 B.3.

1.3 SUBMITTALS

A. Procedure: In accordance with Division One.

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

C. Shop Drawings: Submit dimensioned seating layout, including a complete seating plan developed from the Drawings, showing all chairs, sizes, and aisle widths. Include a section view with profile dimensions and pertinent row and spacing dimensions.

D. Sample: Submit the following.

1. Full yard sample of selected fabric.

2. In addition, when required by Architect, submit a full size sample of each type of seating. After review and approval, the sample of seating may be used in the Work.

E. Warranty Information: Submit manufacturer's standard written warranty.

F. Maintenance data for seating: Submit cleaning and maintenance instructions.

1.4 QUALITY ASSURANCE

A. Installer qualifications: Installer selected from manufacturer's list of approved installers, trained and experienced in installation of indicated product and familiar with the requirements and methods necessary for the proper installation.

B. Materials and Workmanship:

1. Provide new materials of types specified.

2. Turn over all work to the Owner in undamaged condition.

C. Fire performance characteristics of upholstered seating: Provide assemblies complying with the following.

1. Chairs comply with BIFMA F-1, sponsored by the Business and Institutional Furniture Manufacturer's Association, based on testing of chairs representative of those required for Project, and certified accordingly.

2. Finished chairs comply with State of California, Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation, Technical Bulletins 133, 116 and 117.

D. Single-source responsibilities: Obtain each type of seating, including accessories and mounting components, from a single source.

E. Seating Layout: Comply with ADA Rules and Regulations.

F. Field-constructed mockup:

1. Prior to installation of seating, erect mockup consisting of 2 chairs representing extremes of width to be provided; include at least one aisle unit.

2. Locate mockup on site in location directed by Architect.

3. Obtain Architect's acceptance of mockup before beginning production of seating for Project.

4. Retain and maintain mockup during construction in undisturbed condition as a standard for judging completed seating.

5. Accepted mockups in undisturbed condition at time of Substantial Completion may become part of the completed seating installation.

1.5 PROJECT CONDITIONS

A. Environmental conditions: Do not install seating until space is enclosed and weatherproof, wet-work in space is complete and dry, installation of finishes including painting is complete, and other units of work above the ceiling are complete. Do not install seating until ambient temperature and humidity conditions are continuously maintained at final occupancy values.

1.6 HANDLING

A. Deliver product in manufacturer's original unopened protective packaging.

B. Store products in original packaging, under cover, in a manner preventing physical damage, soiling or wetting.

C. Protect product finishes during installation against damage and stains.

1.7 WARRANTY

A. Provide a manufacturer’s warranty covering the structural frame for 5 years. Provide a warranty covering the hinge mechanism for a period of 3 years. Provide a warranty covering integral form cushions for a period of 3 years. Provide a warranty covering all other parts for a period of 3 years, during the first year, of which, the manufacturer will provide parts and labor to replace defective parts. Thereafter, the manufacturer will provide replacement parts.

B. The seating manufacturer shall warrant their products against failures and manufacturing defects except where the product has been subject to accident, alterations, abuse, misuse, or neglect.

1.8 EXTRA MATERIALS

A. Furnish Integral Form cushions and hardware in a quantity equal to 2 percent of the amount of the total seat-count but no less than 12, from the same production run as the materials installed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturer/Model:

1. Rows 1 and 2: Figueras International Seating / Figueras Seating USA, 1908 NW 84th Ave., Miami, FL 33126, provide the 8036 Megatop RK model with pneumatic rocker or equal by Irwin Seating Co.

2. Remaining rows: Figueras International Seating / Figueras Seating USA, 1908 NW 84th Ave., Miami, FL 33126, provide the 8036 Megatop model with PLX Tablet or equal by Irwin Seating Co.

B. Seating:

1. Seat Style: Upholstered seat comprising acoustically perforated one-piece injection molded, high-impact polypropylene seat pan formed to fully enclose Integral Form cushion and fabric edges. Integral Form cushion of injected polyurethane foam, cold-molded and fire-retardant, with internal tubular steel frame and spring structure, with space between underside of cushion and polypropylene seat pan to avoid compression of foam, with fabric fused to the foam using no fasteners, glue or wooden substructure. Integral Form cushion shall be removable for field replacement without re-upholstering.

a. Rows 1 and 2: Seat pan to be fixed in open / down position to allow for pneumatic rocker operation.

2. Back Style: Upholstered back comprising acoustically perforated one-piece injection molded, high-impact polypropylene back shell formed to fully enclose Integral Form cushion and fabric edges. Integral Form cushion of injected polyurethane foam, cold-molded and fire-retardant, with internal tubular steel frame and spring structure, with space between backside of cushion and polypropylene back shell to avoid compression of foam, with fabric fused to the foam using no fasteners, glue or wooden substructure. Integral Form cushion shall be removable for field replacement without re-upholstering. Back angle for planetarium viewing will be determined by Figueras engineering and approved by client. All manufacturers must adhere to custom back angles as per the architectural drawings as required to allow for proper ergonomics for a planetarium installation.

3. Fabric: Figueras Grade 1, Atlanta 06, Turquoise/Black fabric, backed with TS fire barrier.

4. Seat Mechanism: Self-lubricating, self-rising, fully operative double spring hinge mechanism to guarantee consistent full-fold.

5. Arms:

   a. Rows 1 and 2: Self-skinned polyurethane foam with internal metal structure. Black finish. Arm detail TBD.

   b. Remaining rows: Self-skinned polyurethane foam with internal metal structure. Black finish.

6. Aisle end panels, upholstered.

7. Mounting: Floor mounting.

8. Tablet arm except for Rows 1 and 2: PLX tablet arm structurally included in the arm of the chair, black only, vinyl covering.

C. Accessories:

1. Pneumatic Rocker for rows 1 and 2: Pneumatic operated rocker to allow for an additional 15 deg. of motion, tilt, and recline, with a normal 25 deg. incline position (up to 40 deg.).

2. Remaining rows: Folding writing tablet, molded plastic with internal metal structure, model PLX. Typical fixed seating shall be at a fixed incline of 35 deg. except the back row which will have a fixed incline of 30 deg.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions and measurements affecting the work of this Section at site.

B. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 INSTALLATION

A. Seating shall be installed in accordance with the approved shop drawings and the manufacturer's recommendations.

B. The seating plan shall be reproduced on the floor, all dimensions checked against the plan and necessary adjustments made in the layout for all discrepancies.

C. Chairs shall be attached by means of the manufacturer's recommended hardware and fasteners. Each standard shall be attached by no less than two anchoring devices of size and type required to insure that chairs are stable under conditions of normal use.

D. Verify that moving components operate smoothly and quietly.

3.3 CLEAN-UP

A. Remove all trash and debris resulting from the work of this Section and leave areas in an acceptable satisfactory condition. Trash bins to be supplied on site.

B. Replace upholstery damaged during installation.

C. Restore minor abrasions and imperfections in finishes with coating that matches factory-applied finish. Clean and protect work from damage.

END OF SECTION

SECTION 14240
HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Hydraulic passenger elevators.

B. Related work:

1. Division 2 for removal of excess dirt and debris accumulated from excavation of the cylinder hole.

2. Division 16 for the following specified.

a. Electric feeder wires to the terminals of the elevators control panel and necessary mainline switches, circuit breakers or fuses.

b. Outlets in the hoistway for the car lights, in the machine room for elevators signal equipment and in the pit for the pit light.

3. When required by Code, heat and smoke sensing devices at lobby on each floor with electrical conductors terminating at a marked panel in the machine room.

4. Telephone connection at controller in machine room.

C. Definitions:

1. In all cases where a device or a part of the equipment is referred to herein in the singular number, such reference applies to as many such devices as are required to complete the installation.

2. The terms in these Specifications have the definition given in ANSI A17.1, Safety Code for Elevators, Dumbwaiters and Escalators.

1.2 SUBMITTALS

A. Procedure: In accordance with Division One.

B. General: The elevator system shall be designed, submitted for review and installed by a licensed elevator contractor under a deferred submittal to DSA for approval.

C. Shop drawings: Plan views of the pit, hoistway, machine room, elevation, section of the hoistway, seismic equipment design, cab and entrance details and details of the signals.

D. Wiring diagrams: Complete black line transparency set of "As Installed" straight-line wiring diagrams showing the electrical connections of all equipment, in the hoistways as well as the machine rooms, prior to final acceptance. Mount a complete set of wiring diagrams on 1/8-inch Masonite panel attached in a wall-hung rack in machine rooms. Furnish a legend sheet with each set of Drawings containing the following information.

1. Name and symbol of each relay, switch or other electrical apparatus.

    a. Location on Drawings, drawings sheet number and area of switches and relays, etc., and location of all contacts.

    b. Location of apparatus, whether on controller, selector, motor, hoistway or elevators car.

E. Samples:

1. 3 samples of each finish, as requested by the Architect, not including those intended for painting after installation.

2. 3 by 12 inch samples or 12 inch lengths of actual finished materials.

3. Include full size signal equipment to show push-buttons, lights, graphics and mounting provisions.

F. Closeout: Standard size set bound in loose-leaf 3-ring binder.

1. Wiring diagram: Furnish single-line electrical wiring diagram for each elevators system.

2. Erection manuals (field drawings).

3. Sequence of operation of the controls.

4. Operation instructions including complete details, adjustments, instructions relating to the controls and movement of the elevators.

5. Application and adjustment data for all components of elevators installation.

6. Parts list.

7. Lubrication requirements.

8. Maintenance requirements for all equipment.

G. Certificates: Before final acceptance, furnish certificates by authorities having jurisdiction, to permit the Owner's use of the elevators.

H. Deferred approval:

1. The minimum ADesign/Build@ requirements for the Contractor to complete the design of deferred approval items. Contractor shall also comply with any additional requirement imposed by DSA.

2. This Section outlines the minimum information that is required for the deferred approval submittals in order to allow Architect and Engineers of Record to verify that the submittal is in conformance with the overall intent of the design and Contract Documents.

    a. Contractor is responsible to revise Documents as needed to resolve all comments from the Architect and Engineers of Record prior to DSA submittal.

3. These submittals after review by Architect and Structural Engineer of Record shall be submitted to DSA by the Contractor for review and approval. DSA approval of submittal is required prior to fabrication and installation of materials and systems.

a. Contractor is responsible for participation in and completion of DSA review and approval process for all deferred approval items.

4. Engineering:

a. Accommodate all loads on elevator guide rails and supporting bracket without permanent damage to the main structure. Contractor shall obtain all necessary project data and make provisions in the system. The amount of movement that is anticipated by the Contractor shall be identified on the submittal.

b. Fasteners and connections are shown schematically. Engineer shall determine final types and sizes.

c. Connections to the structure shall not impose any eccentric loading or induce twisting or warping to the structural members.

d. Connections to the structure shall be able to accommodate misalignment of the steel structure within the limits allowed by AISC tolerances.

e. The general design concept shown shall be maintained without increasing or decreasing sizes of the mullions or altering profiles and alignments shown.

f. Change or redesign of the structure to accommodate the guide rails or brackets shall be at the contractor's cost and be the responsibility of the contractor's engineer. These changes are subject to the Architect/Structural Engineer's and DSA approval.

1.3 QUALITY ASSURANCE

A. Acceptable manufacturers:

1. To establish a standard of quality, the elevators specified herein and detailed on the Drawings are based on equipment made by ThyssenKrupp Elevators Co.

2. Other acceptable manufacturers listed may submit proposals based upon installation of equipment of their manufacture to provide the same service, finishes, control features and operation - all as approved by the Architect.

a. Mitsubishi Elevators Co.

b. Kone.

c. Schindler Elevators Co.

d. Otis Elevators Co.

B. Standards and codes: The applicable provisions of the following govern the work of this Section.

1. ANSI A17.1, Safety Code for Elevators, Escalators and Dumbwaiters, including supplements. All terms in these Specifications shall have the meaning defined in the ANSI Code.

2. Inspectors' Manual, ANSI A17.2.

3. NEC, ANSI C1.

4. Life Safety Code, NFPA 101.

5. CCR, Titles 8, 19 and 24, State of California Elevators Safety Orders.

6. Vertical Transportation Engineering Standards of the NEII.

C. Tests and inspections: Perform tests as required by governing authorities and/or ANSI A17.2 Elevators Inspectors' Manual, in the presence of authorized representative of such authorities.

1.4 JOB CONDITIONS

A. Adjacent construction: Layout of adjacent work is based on equipment made by ThyssenKrup Elevators Co.

1. Should adjustments be required in adjacent construction to accommodate equipment of other acceptable manufacturers, submit Drawings indicating required revisions in sufficient time to incorporate the changes in the structure.

2. Should these changes involve extra cost, either initially or resulting from changes to Contract Drawings or work in place, pay for such costs.

B. Soil borings: Soil borings have been taken at the site and a report of soil investigation report is available for the Contractor's information; refer to Document 00320.

1.5 MAINTENANCE

A. Provide maintenance of the elevators system during the time when elevators is in use prior to acceptance of the building, and include the cost of same in Bid.

B. Furnish maintenance on the elevators system for 3 months after acceptance of the building, including systematic examination, adjustment and lubrication of all equipment.

1. Also repair or replace electrical and mechanical parts of the elevators equipment whenever required, using only genuine standard parts produced by the manufacturer of the equipment installed.

2. Replace parts and components as often as necessary to maintain an adequate factor of safety and provide and maintain operation and service required by these Specifications.

3. Renewals or repairs necessitated by reason of negligence or misuse of the equipment, except ordinary wear and tear is not included in this maintenance requirement.

C. Perform maintenance work with competent personnel, under the supervision and in the direct employ of the elevators installer.

D. This maintenance service shall be performed solely by the elevators installer and shall not be assigned or transferred to any agent or subcontractor.

E. In addition to the 3 months maintenance, indicate the cost of providing maintenance of the elevators systems for 12 months after expiration of the 3 months maintenance period.

1.6 INTERIM USE

A. Provide interim use of elevators system, before Substantial Completion, for the Owner's use. Such use shall not constitute final acceptance, and shall not infringe upon the warranty and maintenance period.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Hydraulic passenger elevators, platform size and clear hoistway, size as indicated on Drawings.

1. Rated load: 5,000 lb.

2. Rated speed: 125 fpm.

3. Operation: Selective collective automatic.

4. Openings, travel and door opening: As indicated.

5. Car door and hoistway entrances: Horizontal slide, power-operated.

6. Elevators car: As specified.

7. Signals: Illuminated car and hall pushbuttons; car position indicator; car direction sign in car jamb with dual gongs.

2.2 EQUIPMENT

A. Power unit: Designed and manufactured for this service.

1. Include a constant displacement rotary screw type pump, motor, V-belt drive assembly, oil reservoir, hydraulic control unit, full strainer, tank strainer in the suction line, oil-level gage and drip pan.

B. Valves: Control valve including safety check valve, up direction valve with high-pressure relief including up leveling and soft stop features, lowering valve including down leveling and manual leveling feature shall be mounted in a compact unit assembly.

1. Control valves shall be solenoid operated and designed to open and close gradually to give smooth control.

2. Valves shall be readily accessible for adjustment.

C. Automatic 2-way leveling: Provide so that the car will approach landing stops at reduced speed from either direction of travel.

1. The leveling device shall, within its zone, be entirely independent of the operating device and shall automatically stop and maintain the car approximately level with the landing, regardless of change in load.

D. Plunger: Accurately ground and polished seamless steel.

1. The bottom of the plunger shall be fitted with a heavy steel disc welded in place and provided with a suitable extended edge to provide a positive stop designed to prevent the plunger from leaving the cylinder.

2. The top of the plunger shall be provided with an internal welded steel disc drilled and tapped for fastening plunger to the car platen plate.

E. Cylinder: Machined from steel pipe with a machined flange at the upper end and a heavy steel bulkhead welded in the lower end.

1. The cylinder shall be provided with a suitable steel fitting for connecting to oil line and with an air bleeder.

2. Heavy steel brackets suitable for mounting to elevators pit channels shall be welded to the cylinder.

3. A safety bulkhead shall be provided in the cylinder, designed to safely lower the car in the event of failure of the bottom cylinder bulkhead.

F. Packing gland: Steel packing gland with bronze guide bearing, wiper ring and packing especially designed for hydraulic elevators service.

1. Provide an oil collector ring and drain hole.

G. Cylinder/jack protection: The elevators jack shall be enclosed in a Class 160 PVC casing, sealed at the bottom, and sealed to the jack unit at the top.

1. PVC casing shall be watertight.

2. Provide 2 small elbowed tube openings into the PVC casing. These tubes shall be capped in the elevators pit.

3. After installation of the cylinder/jack, fill the PVC casing with oil to the level of the top seal.

4. Monitoring and replenishing oil supply in the PVC casing shall be through the capped tubes in the pit.

H. Piping and oil:

1. Piping from power unit to cylinder complete with necessary fittings.

2. Oil of proper grade for this service.

I. Hydraulic muffler: In the oil line near the power unit. Design to reduce pulsation and noise which may be present in the flow of the hydraulic unit.

J. Platen plate isolation: Mount on suitable sound dampeners designed to isolate the platen plate from the car frame.

K. Power unit isolation: Mount power unit on vibration sound dampeners designed to isolate the unit from the building structure.

L. Low oil control:

1. Design to automatically cause an up traveling car to descend to the lowest terminal landing if the system does not have a sufficient reservoir of oil.

2. Car and hoistway doors shall automatically open at the lowest terminal landing to permit passengers to egress. The doors shall then automatically close and all control buttons, except the "Door Open" button in the car-operating panel, shall be made ineffective.

3. The oil reservoir shall be refilled before the elevators is returned to service.

M. Electric wiring: Provide necessary insulated wiring to connect all parts of the equipment.

1. Insulated wiring shall have a flame-retardant and moisture-resistant outer cover and shall run in metal conduit, metallic tubing or wire ducts.

2. Traveling cables between car and hoistway shall have flame-retardant and moisture-resistant outer cover. They shall be flexible and shall be suitably suspended to relieve strains in the individual conductors.

3. Insulated conduction and conduit or tubing as well as fittings including metal boxes, troughs and ducts shall comply with the requirements of the National Electric Code.

4. Prep elevators for securers access control: Make provisions for future card reader. Provide 18-gage shielded traveling cables.

N. Guide rails: Planed, tongued and grooved steel tees forming matched joints and connected with steel splice plates.

O. Car guide shoes: The top and bottom of the car frame shall be provided with suitable slide guide shoes of the self-aligning swivel type.

P. Buffers: Provide in the elevators pit.

Q. Roller guides:

1. Mount at the top and bottom of the car frame.

2. Each roller guide shall consist of rubber-tired wheels running on the 3 finished rail surfaces.

3. Each wheel shall be equipped with ball bearings and arranged to maintain constant contact with the rail surfaces.

4. Roller guides shall operate on dry, unlubricated rails.

2.3 SPECIFIC REQUIREMENTS

A. Controllers: Electro-magnetic type designed to control starting, stopping and prevent damage to the motor from overload or excess current and to automatically cut off the power supply and bring the car to rest in the event of the operation of any of the safety devices.

B. Selective collective operation:

1. The momentary pressing on one or more car buttons shall send the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed.

2. During this operation, the car shall also answer calls from the landings which are in the prevailing direction of travel and each landing call shall be canceled when answered.

3. With the momentary pressing of a hall button above the car, the car shall start up and answer any up calls as they are reached by the car irrespective of the sequence in which the buttons are pressed.

a. The car shall not stop at floors where down buttons only are pressed.

b. Similarly, the car shall start down to answer calls below the car and shall not stop where up calls only are registered.

c. When traveling up, the car shall reverse at highest call and proceed to answer calls below it.

d. Similarly, when traveling down, the car shall reverse at lowest call and answer calls above it.

4. Should both an up and down call be registered at an intermediate landing, only the call corresponding to the direction in which the car is traveling shall be canceled upon the stopping of the car at the landing.

C. Emergency stop switch: Provide in the car to cut off current supply to motor and down direction valves and bring the car to rest independent of the regular operating devices.

D. Car operating panel: Provide a flush-mounted, unified operating panel containing call registration buttons for each landing, emergency stop switch, alarm button, light switch and telephone instrument. Do not mount these devices individually.

E. Hall buttons: Provide a flush-mounted operating panel containing call registration buttons for each landing, emergency stop switch, alarm button and light switch.

F. Terminal limit switches: Provide terminal limit switches in the hoistway to automatically stop the car at the terminal landings.

G. Illuminated hall buttons:

1. Call registration lights shall be provided in each hall pushbutton unit.

2. When a button is pressed it shall illuminate, signaling to the waiting passenger that the call has been registered.

3. Each button shall remain illuminated until the call has been answered.

H. Car position indicator:

1. An electric multi-light position indicator shall be provided in the car directly over the entrance.

2. The position of the car in the hoistway shall be indicated by illumination of the numeral corresponding to the floor at which the elevators is stopped or passing.

I. Car direction sign:

1. A car direction sign with visual and audible signals shall be provided in the car jamb, located at minimum of 6 feet above the car floor and visible from the proximity of the hall pushbutton fixture to indicate to the waiting passenger the direction the car will travel.

2. Refer to the Drawings for visual signal lens size.

3. The audible signal shall sound once for up and twice for down.

J. Key access switches: Provide at each terminal landing to allow the car to be moved at a reduced speed with landing doors open for inspection maintenance, and repair.

K. Emergency lighting: Provide an emergency light with battery and battery charger connected to the alarm bell.

L. Inspector's operating station: Provide on top of the elevators car consisting of "Up and Down" constant pressure buttons and an emergency stop switch.

M. Pit emergency stop switch: Provide in the elevators pit to cut off current supply to motor and down direction valves and bring the car to rest independent of the regular operating devices.

N. Alarm bell: Provide in or adjacent to the elevators hoistway as directed. Connect to the alarm button in the car-operating panel.

O. Car enclosure:

1. Ceiling: ~~Concealed frame, suspended No. 8 mirror polish~~ Island Type with 6 halogen downlights, wood core, No. 4 stainless steel.

2. Front return wall(s): No. ~~8 polished~~ 4 stainless steel.

3. Side walls: ~~Carpet.~~ Plastic laminate with 1 in. No. 4 stainless steel reveals. Refer to architectural drawings.

4. Base: ~~8 inches high granite.~~ Rubber base, terrazzo (Alternate #7). Refer to Architectural Drawings.

5. Entrance columns: No. ~~8 polished~~ 4 stainless steel. Coordinate with Architects details.

6. Transom: No. ~~8 polished~~ 4 stainless steel.

7. Car door: Flush No. ~~8 polished~~ 4 stainless steel.

8. Car sill(s): Extruded aluminum.

9. Handrail(s): 3-1/2 inches diameter, No. ~~8 polished~~ 4 stainless steel tube on back only.

10. Lighting: ~~Fluorescent indirect above suspended ceiling~~ Halogen downlights.

11. Fan: Single speed exhaust fan.

12. Emergency light with alarm bell and battery.

13. Telephone and cabinet.

14. Emergency exits when required by Code.

15. Certificate frame.

P. Car frame and platform:

1. The car frame which supports the elevators platform and enclosure shall be made of structural steel members.

2. Platform shall consist of a steel frame filled with a suitable sub-floor covered per Architectural Drawings. Under of platform shall be properly fireproofed.

Q. Hoistway entrances:

1. UL labeled hollow metal horizontal sliding center opening type.

2. Each entrance shall have a clear opening 3 feet-6 inches wide by 7 feet high.

3. Each entrance shall include unit frames, flush design door panels, sight guards, extruded aluminum sills, strut angles headers, hanger covers, fascia plates, toe guards, dust covers and necessary hardware.

4. Finish shall be as follows:

   a. Frames and door panels: No. 8 polished stainless steel.

   b. Sight guards: Manufacturer's standard baked enamel.

   c. Fascias, hanger covers, toe guards and dust covers: Manufacturer's standard enamel finish.

   d. Structural members: Prime coat finish.

5. For baked enamel finish, clean surfaces thoroughly of oil, grease and other foreign substances before paint is applied.

   a. Rust-resisting paint shall be applied after which a filler coat shall be baked on.

   b. The surface shall be sanded off level and smooth and a final priming coat of paint applied.

   c. 2 finish coats of solid color enamel shall be baked on.

R. Master door operator:

1. Provide a master gearless door operator with direct current motor to open and close the car and hoistway doors simultaneously at an opening speed of not be less than 2-1/2 feet/second. Closing speed shall not exceed the limitations set by the ANSI Safety Code.

2. Door movement shall be cushioned or checked at both limits of travel. An electro-mechanical interlock shall be provided on each hoistway door to prevent the operation of the elevators unless all doors are closed and locked. An electric contact shall be provided on the car door to prevent the operation of the elevators unless the car door is closed.

3. The door operator shall be arranged so that, in case of interruption or failure of electric power from any cause, the doors can be readily operated by hand from within the car. Emergency devices and keys for opening the doors from the landing shall be provided as required by the local codes.

4. The doors shall open automatically when the car is leveling at the respective landings, and shall close after a predetermined time interval or immediately on pressing a car button. A "Door Open" button shall be provided in the car, the momentary pressing of which shall reopen the doors and reset the time interval.

S. Door edge protective device:

1. The car door shall be provided with a protective device extending the full height and projecting beyond the front edge of the door. The protective device shall retract to a position flush with the front edge of the door when the door is fully open.

2. This device shall be so arranged that should it touch a person or obstruction in its path while the doors are closing, it shall automatically cause the car and hoistway doors to return to the open position.

3. The door shall remain open until the expiration of a time interval and then close automatically.

T. Door hangers and tracks:

1. Hangers and tracks shall be provided at each car and hoistway entrance. Tracks shall be of bar steel with the working surface contoured to match the sheaves.

   a. The hangers shall be designed for power operation and have provisions for vertical and lateral adjustment.

   b. Hangers shall be designed for 2-point suspension of the door panel.

2. Hanger sheaves shall be polyurethane with pre-lubricated and sealed-for-life bearings. Car door hangers shall have 3-1/4 inches diameter sheaves. Hoistway door hangers shall have 2-1/2 inches diameter sheaves.

3. Transmit motion from one door panel to the other with a cable drive.

U. Photo cell door protection:

1. The car shall be equipped with Dual-Ray photoelectric cells actuated by infra-red light rays across the entrance to the car.

2. Interruption of any light ray shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing.

3. The photocells shall cause the doors to remain open as long as the flow of traffic continues and permit them to close shortly after the last person passes through the door opening.

V. Guardian ray cut-out buttons: Provide in the car operating panel, as required by the State of California, Title 8 Elevators Code, to make the guardian ray safety device ineffective in the event of fire or smoke.

W. Guardian ray cut-out switches: A key-operated cut-out switch, located in the car operating panel, shall be provided for the infra-red beams to allow for use of the elevators until repairs are made, in the event of failure of the guardian ray safety device.

X. Microprocessor elevators logic control:

1. The operation shall be accomplished utilizing microprocessor computer logic control. The elevators control program shall be contained in non-volatile, programmable, read-only memory.

2. Control shall be constructed such that future alterations in elevators operation may readily be made by altering the read-only memory.

3. Safety circuits shall be monitored and controlled by the programmable logic control with redundant protection. The microprocessor elevators logic control shall be contained in a cabinet.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine adjacent construction and supports.

B. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 INSTALLATION

A. General: Comply with Code, the approved shop drawings and the elevators manufacturer's instructions and recommendations. Comply with the NEC for electrical work required during installation.

B. Coordination: Coordinate this work with the work of other trades. Use required benchmarks, lines and levels to ensure dimensional coordination of the Work.

C. Phasing: Install sills, struts, headers, hanger covers and unit frames prior to the erection of rough walls and set in proper relation to the car guide rails. Door panels shall be installed after the walls are finished.

D. Cylinder:

1. Drill for cylinder. Hole shall be plumb within tolerance specified by elevator manufacturer.

2. Install casing and cylinder plumb to operate freely with minimum friction.

3. Should the nature of the ground encountered during drilling operations be substantially different than that disclosed by the Soil Investigation Report, the Contract would be adjusted in compliance with the provisions of the Contract.

E. Sound isolation: Mount rotating and vibrating equipment and components on vibration-absorption mounts, designed to effectively prevent the transmission of vibrations to the structure.

F. Lubrication: Lubricate operating parts of system as recommended by the elevators manufacturer.

G. Alignment:

1. Coordinate the installation of hoistway entrances with the installation of guide rails, for accurate alignment of entrances with cars.

2. Wherever possible, delay the final adjustment of sills and doors until the car is operable in the shaft.

3. Reduce clearances to minimum, safe, workable dimension at each landing.

H. Sills: Grout with non-staining, non-shrink grout. Set sills accurately aligned with and slightly above finished floor at landings.

I. Guide rails:

1. Align vertically within a tolerance of 1/16-inch

2. Securely fasten to the hoistway framing with heavy steel brackets.

3. Secure joints without gaps and file irregularities to a smooth surface.

4. Balance elevators to equalize pressure of roller guide shoes on rails.

3.3 MAINTENANCE

A. General: Final acceptance of the installation shall be made only after all field quality control inspections and tests are complete, all submittals and certificates have been received and the Architect satisfied that the following have been satisfactorily completed.

B. Workmanship and equipment comply with Specifications.

C. Contract speed, capacity, and floor-to-floor performance comply with Specifications.

D. Performance of following are satisfactory:

1. Starting, accelerating, running.

2. Decelerating, leveling, stopping.

3. Door operation and closing pressure.

3.4 INSTRUCTIONS - OWNER'S PERSONNEL

A. Instruct the Owner's personnel in the proper use, operation and daily maintenance of the elevators.

B. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies.

C. Train Owner designated personnel in the normal procedures to be followed in checking for the source of an operational failure or malfunction.

END OF SECTION

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SECTION 15060

HANGERS AND SUPPORTS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes piping supports complete.

B. Related Work Specified Elsewhere:

1. Refer to Sections in Division 0, REFERENCE and Division 1, GENERAL REQUIREMENTS.

2. Piping installation is specified in Section 15105, PIPES AND TUBES, and 15180, HEATING AND COOLING PIPING.

3. Vibration isolation hangers and acoustical wall sleeves are specified in Section 15070, MECHANICAL SOUND, VIBRATION, AND SEISMIC CONTROL.

PART 2 PRODUCTS

2.1 MATERIALS

A. All hangers, supports, anchors, inserts and guides shall be in accordance with the American Standard Code for Pressure Piping ANSI B-31.

B. Dielectric Protection. Furnish acceptable protection or copper plated hangers between ferrous and nonferrous metal pipe and hangers on all water piping.

C. Horizontal Piping Hangers:

1. Provide one of the following types of hangers and supports for and vertical horizontal piping manufactured by Anvil International, MW Sausse, ~~or~~ B-line, Tolco, Unistrut, Superstrut, Hilt Corporation, ~~Pipie Sileds~~ Pipe Shields Incorporated.

2. All Pipe Except Copper:

a. Horizontal: Pipe 5" and larger: Provide Clevis type, Anvil International Figure 260 or Figure 300 as required to keep the Clevis nut outside the insulation.

b. Horizontal pipe 4" and smaller: Provide adjustable swivel ring ~~for bare copper,~~ Anvil International Figure ~~CT-~~69~~,~~. For bare uninsulated copper Anvil International Figure ~~69Figure 89~~ CT-69.

c. Hangers shall be sized to fit outside of isolators and support shields (insulated pipe supports).

d. Trapeze Hangers: In ~~leiu~~ lieu of individual hangers, trapeze hangers may be used to support multiple parallel pipes. Trapeze to be Superstrut A-1200-HS, Unistrut P1000 galvanized finish or by B-Line. Pipe restraint shall be Superstrut 702, or Unistrut P2024-2070 series (Restraint shall

allow pipe to move longitudinally without binding). Nuts shall be Superstrut A Channel Master@ or A-100, or Unitrut Equivalent. Spacing of trapeze hangers shall be based on the closest spacing required by the applicable product transported. Contractor shall submit loads carried by each trapeze (and subsequently transferred to the structure) for Architect-s approval.

e. Pipe and duct supports on roof: High density polypropylene UV protection stands with strut, strut/hangers, rollers duct/cable tray as manufactured by PHP systems and design series PPID, PS, PSE-2-2, PSE custom, SS, PPH-D and PPH-RB.

D. Vertical Piping Supports:

1. All Pipe Except Copper:

a. Vertical pipe supports shall be steel extension pipe-clamps, Anvil International Figure 261, galvanized. ~~for~~ For copper water tube, Anvil International ~~CT-121C~~ CT-121.

E. Beam clamps to be malleable iron, Anvil International or forged steel Figure 218/157 or 228 for 3/8 inch (9.5 mm) hanger rods, ~~forged-steel~~ forged steel beam clamp.

F. Inserts:

1. Furnish and set inserts in concrete forms. Provide reinforcing rods for pipe sizes over 3 inch or equivalent.

2. Concrete inserts to be as follows. Black malleable iron universal type for threaded connections with lateral adjustment, Anvil International Figure 282.

3. For group of pipes on trapeze, use two or more inserts to prevent exceeding maximum loading.

G. Saddles and Shields:

1. Saddles.

a. Heating piping and on all domestic hot water piping where water temperature exceeds 140 degrees F. (60 degrees C.).

1) For all piping installed on clevis ring, or roller supports provide B-Line B3160 thru B3165.

b. Cooling Piping.

1) For all piping installed on clevis or ring supports provide B-Line B3151 or B3154.

2) For all piping installed on roller supports provide Pipe Shields Model CSX-CW.

2. Shields.

a. Provide shields to protect insulation in all areas where saddles are not specified to protect insulation at areas of contact with clevis, ring or roller.

b. Provide B-Line B3151 or B3154.

H. Supplementary Framing

1. Where piping or equipment is to be supported and no structural support member is available to fasten to, the Contractor shall provide supplementary structural framing to accommodate supports. All supplementary framing shall be approved by the Architect before installation. Contractor shall provide information to the primary structural framing.

I. Pipe Sleeves

1. Floors

a. Concrete over metal decking: AHilti Corporation@ CP-600 series or pro set systems.

2. Walls, Interior:

a. For pipe penetrations through fire rated floors, walls, partitions, etc., provide fire stop devices and packing in compliance with the requirements of the DSA Fire Marshal. These devices and packing shall comply with the UL AFire Resistance Directory@ for AThrough Penetration Fire Stop Systems (XHEZ),@ systems no WL1001, WL1002, WL1003, WL5002, WL5039, CAJ1001, CAJ7001, FA1010, or other UL systems approved by the DSA Fire Marshal, as applicable.

b. Non-Fire Rated: Adjus-To-Crete@ No. 100 for exposed locations and No. 11 for concealed locations.

3. Walls, Exterior:

a. Concrete: ALinked Seal@ Model WS wall sleeve with model FD or FS seals, as application, or Flexicraft APipe Seal.@

b. Concrete with waterproof membrane: J.R. Smith #1720 wall sleeve with flashing flange and ~~clamo~~ clamp, underdeck clamp, and ALink Seal@ model FD or FS seal, as applicable or Flexicraft A Pipe Seal.@

4. Foundations

a. Schedule 40 galvanized steel pipe below wall footings.

J. Escutcheons

1. For copper tube: Pasco, ~~prme~~ prime coated or chrome plated.

2. For ~~stell~~ steel or cast iron: Pasco, ~~prme~~ prime coated or chrome plated.

3. At plumbing fixtures: Polished chrome plated brass polished stainless steel as specified with fixtures.

K. Pipe Isolation

1. Horizontal Pipe:
a. Bare Pipe: ~~Stonman~~ Stoneman Series 100 or 500 (as applicable) A Trisolator@ Laminate strip is not acceptable.

2. Vertical Pipe

a. 2" x 2" Mason Industries Type WMW isolation pad between riser clamp arms and structure.

b. For intermediate interval supports, Anvil International Figure 103 or equivalent, with bare pipe insulator.

3. Branch Pipe Within Partitions:

a. All branch water, gas and vacuum pipe, Superstrut A Cush-A-Clamp@ #A716 with B-1400 framing channels.

L. Seismic Restraints

1. Seismic restraints may be Apre-approved@ type equivalent to ~~international seismic application techology~~ International Seismic Application Technology (ISAT) or Mason Industries seismic bracing or as designed by a structural engineer. All calculations required by State of California agencies having jurisdiction shall be submitted by the Contractor. All cost borne by the Contractor.

2. Seismic restraints shall be designed to prevent vibration transmission from the item to be restrained into the structure.

M. Fire Resistant Packing (in pipe sleeves or holes)

1. 3M Brand AFire Barrier Caulk CP 25N/S or CP 25S/L@ as applicable, subject to approval by governing authorities.

N. Roof Flashing

1. Elmdor/Stoneman AStormite@ S-1100-4, one-piece , 4 pound lead flashing with cast iron caulk on counter flashing. Sheet metal or A burned@ lead flashings will not be permitted.

PART 3 EXECUTION

3.1 INSTALLATION/APPLICATION/PERFORMANCE/ERECTION

A. Provide hangers to support the required loads. Where necessary, supports shall be designed to permit movement due to expansion and contraction. Where Drawings show details of supports and anchors, conform to details shown. Where details are not shown, conform to the requirements of this Section.

B. Support piping with hangers in direct contact with the pipe for insulated piping not requiring a vapor barrier except on pipes where pipe saddles are specified. Size hangers to fit on the outside of insulation requiring a vapor barrier and on pipes having pipe saddles.

C. Hang pipe from substantial building structure. Piping shall not be hung from other piping. All rigid hangers shall provide a means of vertical adjustment after erection. Do not suspend pipe from the metal roof deck.

D. "C" clamps shall not be used to support piping.

E. Where non-insulated pipes, in which vibration may occur, pass through walls, floors, partitions, encase pipe within acoustical wall sleeves.

3.2 HORIZONTAL PIPING SUPPORT SCHEDULE

A. General. Threaded rod sizes and support spacing shall be in accordance with applicable codes. In case of difference between the applicable codes and the threaded rod and spacing schedule below, use the more stringent of the two requirements (larger rod size, shorter spacing). If the applicable codes do not provide this information, Contractor shall follow guidelines provided in Seismic Restraint Manual Guideline for Mechanical Systems by SMACNA, latest edition including all addenda.

B. Support horizontal piping on threaded hot rolled steel rod. Threaded rod shall not be reduced to sizes smaller than provided for in support thread sizes.

C. Steel Pipe.
Maximum Spacing Between Single Pipe Supports:

Nominal Pipe Size, Inches														
2	:	1	1 3	1 2	2	2 2	3	3 2	4	5	6	8	10	12
Maximum Span, Feet														
5	6	7	7	9	10	11	12	12	14	16	16	16	18	20
Minimum Rod, Inches														
d	d	d	d	d	d	2	2	2	e	e	:	:	1	1 3
Maximum Span, ~~Metres~~ Meters														
1.5	1.8	2.1	2.1	2.7	3.0	3.4	3.7	3.7	4.3	4.9	4.9	4.9	5.5	6.1
Minimum Rod, ~~Millimetres~~ Millimeters														
9.5	9.5	9.5	9.5	9.5	9.5	13	13	13	16	16	19	19	24	32

D. Copper Tubing.
Maximum Spacing Between Single Pipe Supports

Nominal Tubing Size, Inches										
2	:	1	1 3	1 2	2	2 2	3	3 2	4	6
Maximum Span, Feet										
5	6	6	7	8	9	10	10	11	12	14
Maximum Span, ~~Metres~~ Meters										
1.5	1.8	1.8	2.1	2.4	2.7	3.0	3.0	3.4	3.7	4.2

Furnish minimum rod size as specified for steel pipe.

E. Support steel piping 14 inches and larger at 20 foot (6 m) intervals or less to insure even distribution of loading on structural members. For all pipe sizes above 12 inch, rod size shall be 1-1/2 inches (38 mm).

F. The spacing specified herein is included to limit deflection in the pipe to an acceptable minimum. Shorten intervals as necessary so the support manufacturer's maximum recommended safe load values in accordance with ANSI B 31 are not exceeded.

G. Cast iron pipe shall be supported at each hub.

H. Trapeze Hanger. Spacing shall not be farther than the closest interval required for any size pipe supported thereby, or as necessary to prevent damage or failure to the structure. Provide additional framing as required to transfer loads to adequate structure.

I. Supporting rods over 18 inches (460 mm) long shall be braced at every fourth hanger with diagonal bracing attached to the structure.

3.3 VERTICAL PIPING SUPPORT

A. Support vertical piping with wrought steel riser clamps. Make adequate provision for expansion, contraction, and lateral stability.

B. Support steel pipe at a minimum of every other floor as required to relieve joint stresses.

C. Where pipe sleeves extend above floor, place pipe clamps at ceiling below, support ~~clamp-end~~ clamp end extension from inserts.

3.4 ATTACHMENTS TO BUILDING STRUCTURE

A. Metal Deck with Concrete Slab:

1. Holes through metal deck for steel deck insert shall be drilled per manufacturer-s recommendations.

2. Punched holes through metal deck will not be permitted.

3. Contractor to take all necessary precautions to assure that inserts are vertical when concrete is poured.

3.5 PIPE SLEEVES

A. Pipe sleeves shall be provided for all pipes passing through walls, floors, foundations, partitions, and ceiling, except for framed openings and core drilled holes. For concrete construction, set sleeves in forms before concrete is poured.

B. Size sleeve to provide 1" maximum clearance between pipe and sleeve. Sleeve shall be sized to pass pipe with insulation applied.

C. Sleeves or holes through fire rated floors, walls, etc. shall have the annular spacing between sleeve and pipe packed with resilient packing approved by the Fire Marshal, to meet the fire rating of the separation.

3.6 ESCUTCHEONS

A. Provide escutcheons at all exposed pipes passing through walls, floors ceilings and partitions. Escutcheon shall fit outside of pipe insulation.

3.7 PIPE ~~INSOLATION~~ ISOLATION

A. Piping shall not contact structure at any time:

1. All horizontal suspended water and gas, air, laboratory air and vacuum piping shall be isolated at each hanger and support to prevent noise transmission to the building structure. Insulated pipe isolation shall be afforded by support shields.

2. All vertical water and gas, air, laboratory air and vacuum piping shall have pipe isolation pads between riser clamp arms and structure.

3. All branch water, gas, laboratory air and vacuum piping within partitions shall be supported by Superstrut ACush-A-Clamp= supports and framing channel. Framing channel shall be fasten to studs by welding or appropriate sheet metal screws, and Superstrut fittings or brackets.

B. Makeshift methods of supporting pipe within partitions are not acceptable. This includes wrapping of pipe with felt or other material and wiring to strips of metal or other material.

C. Other methods of support and isolation equivalent to the specified item and proven to be accepted by the local authorities having jurisdiction and the State Fire Marshall.

3.8 SUPPORT SHIELDS FOR INSULTED PIPING AND TUBING

A. Provide a support shield at each hanger and support for all insulated pipe and tubing.

3.9 WORK OF OTHER TRADES

A. The work of section 15050 shall not be supported from supports or hangers provided for the work of other trades.

B. The work of trades other than that covered under section 15050 shall ~~bot~~ not be supported from supports or hangers provided for work specified under section 15050.

END OF SECTION

SECTION 15510

HEATING BOILERS AND ACCESSORIES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes furnishing and installing of all materials as hereinafter specified or shown on the Drawings, necessary for the complete heating system primary equipment.

B. Related Work Specified Elsewhere

1. Refer to Section 15050 and all sections in Division 0, REFERENCE and Division 1, GENERAL REQUIREMENTS.

2. Other sections as noted herein.

1.2 SUMMARY

A. This Section includes gas fired, condensing finned copper water tube boilers for heating hot water.

B. Related Sections include the following:

1. Division 15 Section "Breechings, Chimneys, and Stacks" for connections to breechings, chimneys, and stacks.

2. Division 15 Section "Fans" for connections to condensate and feedwater system.

3. Division 15 Sections for control wiring for automatic temperature control (DDC).

1.3 SUBMITTALS

A. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, and method of field assembly, components, and location and size of each field connection.

B. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each model indicated.

1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer installed and field installed wiring.

C. Source Quality Control Tests and Inspection Reports: Indicate and interpret test results for compliance with performance requirements before shipping.

D. Field Test Reports: Indicate and interpret test results for compliance with performance requirments.

E. Maintenance Data: Include in the maintenance manuals specified in Division 1. Include parts list, maintenance guide, and wiring diagrams for each boiler.

1.4 QUALITY ASSURANCE

A. Listing and Labeling: Provide electrically operated components specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

B. ASME Compliance: Boilers shall bear ASME "H" stamp and be National Board listed.

C. ASME Compliance: Secondary heat exchanger shall meet ASME Section VIII.

D. CSD-1 Compliance: Control devices and control sequences according to requirements of CSD-1.

E. FM Compliance: Control devices and control sequences according to requirements of FM.

F. IRI Compliance: Control devices and control sequences according to requirements of IRI.

G. Comply with NFPA 70 for electrical components and installation.

1.5 COORDINATION

A. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete.'

1.6 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents. Installing contractor shall provide one year of warranty parts and labor.

B. Special Warranty: Submit a written warranty, executed by the contractor for the heat exchanger.

1. Warranty Period: Manufacturer's standard, but not less than 10 years from date of Substantial Completion on the heat exchanger. Warranty shall be non-prorated and not limited to thermal shock. Additional 21 year thermal shock warranty on heat exchanger.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Manufacturer shall be a company specializing in manufacturing the products specified in this section with minimum five (5) years experience. Subject to compliance with requirements, manufacturers offering boilers that may be incorporated into the Work include, but are not limited to, the following:

1. RBI (a Mestelz Company) and Patterson – Kelley (Harsco).

B. Design: Boilers shall be CSA design certified as a condensing boiler. Boilers shall be equipped to accept return water temperatures as low as 40"F, 4'C and operate in the condensing mose at all times. Boilers shall be designed for a minimum of 3:1 continuous turn down with constant CO2 over the turndown range. The boiler shall operate with natural or propane gas and have a I=B=R certified input rating as noted on the drawings, and a thermal efficiency rating of 94.9% at rated input and 99.1% at minimum input. The boiler shall incorporate a symmetrically air-fuel coupled such that changes in combustion air flow or flue flows affect the BTUH input without affecting combustion quality. The boiler will automatically adjust input for altitude and temperature induced changes in air density. The boiler will use a proven pilot interrupted spark ignition system. The boiler shall use a UL approved flame safeguard ignition control system using UV detection flame sensing. The design shall provide for silent burner ignition and operation. Burner shall be premix radial-type and fire in a 3600 vertical pattern. Boiler shall be able to vent a horizontal distance of 60 equivalent feet, 18.3 m.

C. Service Access: The boilers shall be provided with stainless steel jacket panels, minimum 16 gauge, with push-button fasteners for easily accessing all serviceable components. Sheet metal screws may not be used in the securing of jacket panels to the boiler. The boilers shall not be manufactured with large enclosures, which are difficult to remove and reinstall. All accesses must seal completely as not to disrupt the sealed combustion process. All components must be accessible and able to adjust with the removal of a single cover or cabinet component.

D. Indicating Lights: Each boiler shall include a diagnostic control panel with a full text display indicating the condition of all interlocks and the BTUH input percentage. Access to the controls shall be through a swing-access door, leaving diagnostic panel intact and not disrupted.

~~E.Manufacturers: RBI (a Mestek Company) is the basis of design.~~

2.2 COMPONENTS

A. Combustion Chamber: The combustion chamber shall be constructed of minimum 16 gauge stainless steel or aluminum. ~~Aluminum or galvanized steel is not acceptable.~~ An access door shall be provided for ease of service and inspection of the heat exchanger.

B. Heat Exchanger: The heat exchanger shall be inspected and bear the A.S.M.E. Section IV seal of approval. The heat exchanger shall be a four-pass heat exchanger with a maximum working pressure of ~~160~~ 100 psi. The heat exchanger's vertical design shall provide equal amounts of heat transfer throughout the entire heating surface. Each heat exchanger shall have copper tubes, with an integral copper finned tube of *7/8"* I.D., .064" minimum wall thickness, 7 fins per inch, with a fin height of *3/8".* Each end of the water tubes shall be strength rolled into the header. The heat exchanger shall be gasket-less. Each individual tube can be re-tubed without the disturbance of the surrounding tubes. A pressure relief valve of 50 Ib/sq. in. shall be equipped with the boiler and factory mounted. The headers shall be of bronze construction only; cast iron shall not be acceptable.

The secondary heat exchanger shall be inspected and bear the ASME Section VIII seal of approval. The heat exchanger shall have a maximum working pressure of 160 psi. Each heat exchanger shall be constructed of 316L stainless steel throughout the internal vessel and 304L stainless steel for the external shell. Secondary heat exchanges constructed if finned copper or cupronickel tubes shall not be acceptable.

C. Jackets: 18 gauge brushed stainless steel

D. Gas Burner: Metal fiber mat premix burner shall fire to provide equal distribution of heat throughout the entire heat exchanger. Burner composition shall be FecralloyTM. The burner shall be easily removed for maintenance without the disruption of any other major component of the boiler. Ignition electrodes shall be removed for inspection and proper alignment without removing the burner. A window view port shall be provided for visual inspection of the flame during firing.

E. Ignition Components: The ignition hardware shall consist of dual Alumina ceramic insulated ignition electrodes and UV sensing tube permanently arranged to ensure proper ignition, electrode and UV alignment. Electrodes must be capable of removal while leaving the burner intact. Hot surface ignition systems of any type *will not* be accepted.

F. Rated Capacity: The boiler shall be capable of operating at rated capacity with pressures as low as 2" WC. at the inlet to the burner pressure regulator. Boilers that cannot provide full BTUH inputs at 2" W.C. *will not* be accepted.

G. The burner shall be capable of 99.1 % efficiency without exceeding a NOx reading above 20 ppm.

H. The burner and gas train shall be provided with the following trim and features:

1. Burner Firing: Full modulation with 3:1 turndown @ Continuous CO2

2. Burner Ignition: Intermittent spark

3. Safety Controls: Energize ignition, limit time for establishing flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, and allow gas valve to open.

4. Flue Gas Collector: Enclosed combustion chamber with integral combustion air blower and single venting connection.

5. Gas Train: Manual gas valves (2), main gas valve (motorized), 'B' valve, pilot gas pressure regulator, and automatic pilot gas valve. All components to be factory mounted.

6. Safety Devices: Optional high/low gas pressure switches, air flow switch, and blocked flue detection switch. All safeties to be factory mounted.

2.3 BOILER TRIM

A. Safety Relief Valve: ASME rated, factory set to protect boiler and piping as per schedule/drawings.

B. Gauge: Combination water pressure and temperature shipped factory installed. LCD inlet/outlet temperature gauges to be an integral part of the front boiler control panel to allow for consistent easy monitoring of temperatures factory mounted and wired.

C. Flow Switch: Prevent burner operation when water falls below a safe level or when water flow is low. Flow switch shall be factory mounted and wired. Provision for installation of a low water cut off shall be provided.

D. Operating Controls: Boiler shall be provided with a Honeywell RM7895C series digital flame safeguard. The flame safeguard shall be capable of prepurge cycles.

E. Operating Temperature Control: Shall be a digital P.I.D. controller adjustable from 40' F to 240' F, 4' C to ·116' C. Control shall have the capability to provide outdoor air reset

function. Control shall be factory mounted and sense the inlet and outlet temperature of the boiler through a resistance sensor.

F. High Limit: Temperature control with manual reset limits boiler water temperature in series with the operating control. High Limit shall be factory mounted and sense the outlet temperature of the boiler through a dry well.

G. Provide the following standard trim:

1. Bronze headers
2. Low air pressure switch
3. Blocked flue detection switch
4. Flow switch (factory mounted and wired)
5. Modulation control
6. Temperature/pressure gauge
7. Manual reset high limit
8. Air inlet filter
9. Inlet/outlet temperature display
10. Full digital text display for all boiler series of operation and failures
11. Variable frequency drive and combustion air fan
12. FM and CSD-1 gas train
13. Condensate "P" trap
14. Bypass assembly which includes mixing valve, circulator and piping

H. Provide the following job specific trim and features:

1. Air inlet hood for exterior termination of air intake pipe (shipped loose)
2. Vent termination hood for exterior termination of vent pipe (shipped loose)
3. FM or IRI controls and gas train
4. CSD-1 controls
5. Diagnostic keyboard display for RM7800 series control
6. Probe type low water cut off, manual reset (shipped loose)

2.4 MOTORS

A. Refer to Division 15 Section 15050 “BASIC MECHANICAL MATERIALS AND METHODS” for factory installed motors.

B. Boiler Blower Motor: Open drip-proof motors where satisfactorily housed or remotely located during operation. There shall be no requirement to remove gas train components to remove the blower motor. Blower motor *shall not* exceed 1 HP and *not* require more than 13 amps.

2.5 SOURCE QUALITY CONTROL

A. Test and inspect boilers according to the ASME Boiler and Pressure Vessel Code, Section IV. Boilers shall be test fired in the factory with a report attached permanently to the exterior cabinet of the boiler for field reference.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine area to receive boiler for compliance with requirements for installation tolerances and other conditions affecting boiler performance. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install boilers level and plumb, according to manufacturer's written instructions and referenced standards.

B. Install gas-fired boilers according to NFPA 54.

C. Support boilers on 4" (100 mm) thick concrete base, 4" (100 mril) larger on each side than base of unit.

D. Install electrical devices furnished with boiler, but not specified to be factory mounted.

E. Install a 3/4" drain valve on the outlet piping prior to the first shut off valve.

3.3 CONNECTIONS

A. Connect gas piping full size to boiler gas train inlet with union.

B. Connect hot water piping to supply and return boiler tappings with shutoff valve and union or flange at each connection.

C. Install piping from safety relief valves to nearest floor drain.

D. Connect breeching to boiler outlet, full size of outlet. The boiler shall operate under positive (Category IV) stack pressure. Vent material must be listed AL29-4C Stainl~ss Double Wall Stack for condensing appliances.

E. Electrical: Comply with applicable requirements in Division 16 Sections.

F. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque tightening values. If manufacturer's torque values are not indicated, use those specified in UL486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory authorized service representative to supervise the field assembly of components and installation of boilers, including piping and electrical connections. Report results in writing.

1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Manufacturer's representative shall supply a factory authorized service technician to start up the boilers.

3.5 CLEANING

A. Flush and clean boilers on completion of installation, according to manufacturer's written instructions.

B. After completing boiler installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes including chips, scratches, and abrasions with manufacturer's stainless steel cleaner.

3.6 COMMISSIONING

A. Engage a factory authorized service representative to provide startup service. Start up to be performed only after complete boiler room operation is field verified to offer a substantial load, and complete system circulation. One year warranty shall be handled by factory authorized tech.

B. Verify that installation is as indicated and specified.
1. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 16 Sections. Do not proceed with boiler startup until wiring installation is acceptable to equipment Installer.

C. Complete manufacturer's installation and startup checklist and verify the following:

1. Boiler is level on concrete base.

2. Flue and chimney are installed without visible damage.

3. No damage is visible to boiler jacket, refractory, or combustion chamber.

4. Pressure reducing valves are checked for correct operation and specified relief pressure. Adjust as required.

5. Clearances have been provided and piping is flanged for easy removal and servicing.

6. Heating circuit pipes have been connected to correct ports.

7. Labels are clearly visible.

8. Boiler, burner, and flue are clean and free of construction debris.

9. Pressure and temperature gauges are installed.

10. Control installations are completed.

D. Ensure pumps operate properly.

E. Check operation of pressure reducing valve on gas train, including venting.

F. Check that fluid level, flow switch, and high temperature interlocks are in place.

G. Start pumps and boilers, and adjust burners to maximum operating efficiency.

1. Fill out startup checklist and attach copy with Contractor Startup Report.

2. Check and record performance of factory provided boiler protection devices and firing sequences.

3. Check and record performance of boiler fluid level, flow switch, and high temperature interlocks.

4. Run-in boilers as recommended or required by manufacturer.

H. Perform the following tests for each firing rate for high/low burners and forl 00, 66, and 33 percent load for modulating burners. Adjust boiler combustion efficiency at each firing rate. Measure and record the following:

1. Inlet gas pressure.

2. Gas pressure on manifold.

3. Flue gas temperature at boiler discharge.

4. Flue gas carbon dioxide and oxygen concentration.

5. Natural flue draft.
6. Measure and record temperature rise through each boiler.

3.7 DEMONSTRATION

A. Engage a factory authorized service representative to train Owner's maintenance personnel as specified below:

1. Operate boiler, including accessories and controls, to demonstrate compliance with requirements.

2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.

3. Review data in the maintenance manuals. Refer to Division 1 Section 01770, “CLOSEOUT PROCEDURE”.

4. Review data in the maintenance manuals. Refer to Division 1 Section 01780 "OPERATION AND MAINTANENCE MANUALS."

5. Schedule training with Owner with at least 7 days advance notice.

END OF SECTION

SECTION16134
CABLE TRAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cable tray.

B. Related Sections:

1. Section 07840 - Firestopping.

2. Section 16060 - Grounding and Bonding.

3. Section 16070 - Hangers and Supports.

1.2 REFERENCES

A. ASTM International:

1. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

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.

B. National Electrical Manufacturers Association:

1. NEMA VE 1 - Metal Cable Tray Systems.

2. NEMA VE 2 - Metal Cable Tray Installation Guidelines.

1.3 SUBMITTALS

A. Section 01340 - Shop Drawings, Product Data and Samples: Submittal procedures.

B. Shop Drawings: Indicate tray type, dimensions, support points, and finishes.

C. Product Data: Submit fittings and accessories.

D. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.4 CLOSEOUT SUBMITTALS

A. Section 01770 – Closeout Procedures.

B. Project Record Documents: Record actual routing of cable tray and locations of supports.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

PART 2 - PRODUCTS

2.1 METAL WIRE MESH BASKET TYPE CABLE TRAY

A. Manufacturers:

1. Cablofil Legrand Type PG.

2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: NEMA VE 1, metal wire mesh/basket cable tray.

C. Material: Steel.

D. Finish: ASTM A653/A653M, mill-galvanized before fabrication.

E. Inside Width: As indicated on Drawings or as required to accommodate cable fill.

F. Inside Depth: As indicated on Drawings or as required to accommodate cable fill.

G. Inside Radius of Fittings: As indicated on Drawings.

H. Furnish manufacturer's standard clamps, hangers, brackets, splice plates, reducer plates, blind ends, barrier strips, connectors, and grounding straps.

2.2 WARNING SIGNS

A. Engraved Nameplates: 1/2 inch black letters on yellow laminated plastic nameplate, engraved with: WARNING! DO NOT USE CABLE TRAY AS WALKWAY, LADDER, OR SUPPORT. USE ONLY AS MECHANICAL SUPPORT FOR CABLES AND TUBING!

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install metal cable tray in accordance with NEMA VE 2.

B. Support trays and fasten to structure and finishes in accordance with Section 16070. Install supports at each connection point, at end of each run, and at other points to maintain spacing between supports of 5 ft maximum.

C. Install expansion connectors where drawings show building expansion joints.

D. Install firestopping in accordance with Section 07840 to sustain ratings when passing cable tray through fire-rated elements.

E. Ground and bond metal cable tray in accordance with Section 16060.

1. Provide continuity between tray components.

2. Use anti-oxidant compound to prepare aluminum contact surfaces before assembly.

3. Install 2 AWG bare copper equipment grounding conductor through entire length of tray; bond to each component.

4. Make connections to tray using mechanical, compression or exothermic connectors.

F. Install warning signs at 50 feet centers along cable tray, located to be visible.

END OF SECTION

SECTION 16235

ENGINE GENERATORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes engine generator set, exhaust silencer and fittings, transfer switch, fuel fittings and day tank, remote control panel, load bank, battery, and charger.

B. Related Sections:

1. Section 15070 - Mechanical Sound, Vibration, and Seismic Control.

2. Section 15080 - Mechanical Insulation.

3. Section 15130 - Pumps.

~~4.Section 15810 - Ducts.~~

~~5.~~4. Section 16413 - Enclosed Transfer Switches.

1.2 REFERENCES

A. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

2. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.

3. NEMA ICS 10 - Industrial Control and Systems: AC Transfer Switch Equipment.

4. NEMA MG 1 - Motors and Generators.

B. International Electrical Testing Association:

1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. National Fire Protection Association:

1. NFPA 30 - Flammable and Combustible Liquids Code.

~~2.NFPA 99 - Standard for Health Care Facilities.~~

~~3.~~2. NFPA 110 - Standard for Emergency and Standby Power Systems.

1.3 SYSTEM DESCRIPTION

A. Description: Engine generator assembly and accessories to provide source of power for Level 1 and 2 applications in accordance with NFPA 110.

B. Capacity: 500 kW, 625 kVA at elevation of 1000 feet (m) above sea level, standby rating using specified engine cooling scheme.

1.4 SUBMITTALS

A. Section 01340 and 01340A – Shop Drawings, Product Data and Samples: Submittal Transmittal.

B. Manufacturer shall submit application to Air Quality Management District (AQMD) for installation of generator set. Generator sets shall meet current AQMD standards and EPA regulations at the time of installation.

C. Shop Drawings: Indicate electrical characteristics and connection requirements. Include plan and elevation views with overall and interconnection point dimensions, fuel consumption rate curves at various loads, ventilation and combustion air requirements, electrical diagrams including schematic and interconnection diagrams.

D. Product Data: Submit data showing dimensions, weights, ratings, interconnection points, and internal wiring diagrams for engine, generator, control panel, transfer switch, battery, battery rack, battery charger, exhaust silencer, vibration isolators, day tank, and remote radiator.

E. Test Reports: Indicate results of performance testing.

F. Manufacturer's Field Reports: Indicate inspections, findings, and recommendations.

1.5 CLOSEOUT SUBMITTALS

A. Section 01770 – Closeout Procedure.

B. Operation and Maintenance Data: Submit instructions and service manuals for normal operation, routine maintenance, oil sampling and analysis for engine wear, and emergency maintenance procedures.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with service facilities within 50 miles of project.

B. Supplier: Authorized distributor of specified manufacturer with minimum 25 years documented experience.

1.7 WARRANTY

A. Section 01782 - Execution Requirements: Product warranties and product bonds.

B. Furnish five year manufacturer warranty.

1.8 MAINTENANCE SERVICE

A. Furnish service and maintenance of engine generator and transfer switch for one year from Date of Substantial Completion. Contract shall include quarterly visits with yearly complete service and oil change and oil analysis.

1.9 MAINTENANCE MATERIALS

A. Furnish one set of tools required for preventative maintenance of engine generator system. Package tools in adequately sized metal tool box.

B. Furnish two of each fuel, oil and air filter element.

C. Spare parts at parts facility shall be available 24 hours per day.

PART 2 PRODUCTS

2.1 SERVICE CONDITIONS

A. Temperature: degrees F (50 degrees C).

B. Altitude: 1000 feet.

C. Other Unusual Service Conditions.

2.2 ENGINE

A. Manufacturers:

1. Caterpillar Model ~~3516B~~ C15.

2. Substitutions: Not Permitted.

B. Product Description: Water-cooled in-line or V-type, four-stroke cycle, compression ignition Diesel internal combustion engine.

C. Rating: Sufficient to operate under 100 rated load for the duration of the power outage at an ambient of 110 degrees F at elevation of 1000 feet.

D. Fuel System: No. 2 fuel oil.

E. Engine speed: 1800 rpm.

F. Safety Devices: Engine shutdown on high water temperature, low oil pressure, overspeed, and engine overcrank. Limits as selected by manufacturer.

G. Engine Starting: DC starting system with positive engagement, number and voltage of starter motors in accordance with manufacturer's instructions. Furnish remote starting control circuit, with MANUAL-OFF-REMOTE selector switch on engine-generator control panel.

H. Engine Jacket Heater: Thermal circulation type water heater with integral thermostatic control, sized to maintain engine jacket water at 90 degrees F (32 degrees C), and suitable for operation on 208 volts AC.

I. Radiator: Radiator using glycol coolant, with blower type fan, sized to maintain safe engine temperature in ambient temperature of 110 degrees F (43 degrees C). Radiator air flow restriction 0.5 inches of water (1.25 Pa) maximum.

J. Engine Accessories: Fuel filter, lube oil filter, intake air filter, lube oil cooler, fuel transfer pump, fuel priming pump, gear-driven water pump. Furnish fuel pressure gage, water temperature gage, and lube oil pressure gage on engine/generator control panel.

K. Mounting: Furnish unit with suitable spring-type vibration isolators and mount on structural steel base.

2.3 GENERATOR

A. Manufacturers:

1. Caterpillar Model ~~SR4B~~ LC6114F.

2. Substitutions: Not Permitted.

B. Product Description: NEMA MG1, three phase, four pole, reconnectable brushless synchronous generator with brushless exciter.

C. Rating: 500 kW, 625 kVA, at 0.8 power factor, 480Y/277 volts, 60 Hz at 1800 rpm.

D. Insulation Class: F.

E. Temperature Rise: 105 degrees C Continuous.

F. Enclosure: NEMA MG1, open drip proof.

G. Voltage Regulation: Furnish generator mounted volts per hertz exciter-regulator to match engine and generator characteristics, with voltage regulation plus or minus 1 percent from no load to full load. Furnish manual controls to adjust voltage droop, voltage level (plus or minus 5 percent) and voltage gain.

2.4 GOVERNOR

A. Manufacturers:

1. Caterpillar Advanced Digital Engine Management Model.

2. Substitutions: Not Permitted.

B. Product Description: Isochronous governor to maintain engine speed within 0.5 percent, steady state, and 5 percent, no load to full load, with recovery to steady state within 2 seconds following sudden load changes. Equip governor with means for manual operation and adjustment.

2.5 ~~DAY TANK~~ BASE MOUNTED FUEL TANK

A. Manufacturers:

1. Support Products, Inc

2. Substitutions: Not Permitted.

B. Product Description: 500 gallon base mounted ~~day~~ base tank unit ~~with float switch to control main tank pumps~~.

C. Furnish flexible fuel line connections, fuel gage, check valve, high fuel level alarm contact, and indicating light.

D. Conform to NFPA 30.

2.6 ACCESSORIES

A. Exhaust Silencer: Hospital grade type silencer, with muffler companion flanges and flexible stainless steel exhaust fitting, sized in accordance with engine manufacturer's instructions.

Engine exhaust and radiator discharge air shall be directed upward and away from buildings.

B. Batteries: Heavy duty, diesel starting type lead-acid storage batteries, 170 ampere-hours minimum capacity. Match battery voltage to starting system. Furnish cables and clamps.

C. Battery Tray: Treated for electrolyte resistance, constructed to contain spillage.

D. Battery Charger: Current limiting type designed to float at 2.17 volts for each cell and equalize at 2.33 volts for each cell. Furnish overload protection, full wave rectifier, DC voltmeter and ammeter, and 120 volts AC fused input. Furnish wall mounted enclosure to meet NEMA 250, Type 1 requirements.

E. Line Circuit Breaker: NEMA AB 1, molded case circuit breaker on generator output with integral thermal and instantaneous magnetic trip in each pole. Furnish battery voltage operated shunt trip, connected to open circuit breaker on engine failure. Unit mount in enclosure to meet NEMA 250, Type 1 requirements.

F. Engine-Generator Control Panel: NEMA 250, Type 1 generator-mounted control panel enclosure with engine and generator controls and indicators. Furnish provision for padlock and the following equipment and features:

1. Frequency Meter: 45-65 Hz. range, 3.5 inch (89 mm) dial.

2. AC Output Voltmeter: 3.5 inch (89 mm) dial, 2 percent accuracy, with phase selector switch.

3. AC Output Ammeter: 3.5 inch (89 mm) dial, 2 percent accuracy, with phase selector switch.

4. Output voltage adjustment.

5. Push-to-test indicator lamps, one each for low oil pressure, high water temperature, overspeed, and overcrank.

6. Engine start/stop selector switch.

7. Engine running time meter.

8. Oil pressure gage.

9. Water temperature gage.

10. Auxiliary Relay: 3PDT, operates when engine runs, with contact terminals prewired to terminal strip.

11. Additional visual indicators and alarms in accordance with by NFPA 110.

12. Remote Alarm Contacts: Factory wire SPDT contacts to terminal strip for remote alarm functions as specified.

G. Remote Annunciator Panel: Surface mounted panel with brushed stainless steel. Furnish audible and visible indicators and alarms in accordance with NFPA 110 and as follows:

1. High battery voltage (alarm).

2. Low battery voltage (alarm).

3. Low fuel (alarm).

4. System ready.

5. Anticipatory-high water temperature.

6. Anticipatory-low oil pressure.

7. Low coolant temperature.

8. Switch in off position (alarm).

9. Overcrank (alarm).

10. Emergency stop (alarm).

11. High water temperature (alarm).

12. Overspeed (alarm).

13. Low oil pressure (alarm).

14. Line power available.

15. Generator power available.

16. Lamp test and horn silence switch.

2.7 SOURCE QUALITY CONTROL

A. Provide shop inspection and testing of completed assembly.

B. Make completed engine-generator assembly available for inspection at manufacturer=s factory prior to packaging for shipment. Notify Owner Architect/Engineer at least seven days before inspection is allowed.

C. Allow witnessing of factory inspections and tests at manufacturer=s test facility. Notify Owner at least seven days before inspections and tests are scheduled.

2.8 SOUND ATTENUATED ENCLOSURE SPECIFICATIONS

A. The generator, fuel daytank, batteries and battery charger shall be completely housed in an outdoor, walk-in style sound attenuated enclosure designed for a maximum sound pressure level of 80 dB(a) measured 3.3 feet (1meter) from the enclosure.

B. The enclosure shall have a minimum of four common key locking doors. Doors shall match the wall construction with freezer style, panic type hardware. All doors shall be gasketed with a high quality bulb seal. Glued on neoprene gasket strips are not acceptable.

C. A 4 point lifting system shall be incorporated on the sloped roof. The enclosure shall be minimum.

D. 12 gauge all welded construction with acoustic insulation having a UL listed flame spread of 25 or less. Provide an adequate frame work to meet seismic zone 4 requirements and 100 MPH wind loading. The interior shall be fully lined with a perforated galvanized sheet

metal skin riveted to the frame at 24" on center. Screw type fasteners will not be acceptable.

E. Air shall enter and discharge the enclosure through hushducts designed to meet the cooling fan requirements. An acoustic turn scoop shall be provided for vertical air discharge. Provide an access door and drainage system for the discharge plenum.

F. Provide support cross members for the roof mounted exhaust silencer, complete with a suitable rain shield for the roof penetration.

G. An iron oxide alkyd primer shall be applied to all non galvanized surfaces. The finish coat shall consist of a high quality alkyd enamel, suitable for inland salt air environments. The top coat shall be applied with an esthetic textured finish.

H. The enclosure shall be supplied with interior fluorescent AC lighting, 3-way switches and GFIC type convenience outlets, pre-wired to a 100A rate, single phase service panel. All wiring shall be concealed behind the wall skin, and conform to NEC requirements. Surface mounted conduits are not acceptable. The service panel shall include all necessary feeder breakers plus two additional spares.

I. The enclosure manufacture shall be regularly engaged in the design and production of generator enclosures with a minimum of 10 years experience. The manufacturer shall have a minimum of 10 similar successful installations in California. The enclosure shall be manufactured by Acoustical Control, Inc or Support Products.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install engraved plastic nameplates in accordance with Section 16075.

B. Ground and bond generator and other electrical system components in accordance with Section 16060.

3.2 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Testing and inspection services and testing, adjusting, and balancing.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.22.

3.3 MANUFACTURER'S FIELD SERVICES

A. Section 01450 - Quality Control: Manufacturer=s field services.

B. Prepare and start up engine-generator assembly.

3.4 ADJUSTING

A. Adjust generator output voltage and engine speed to meet specified ratings.

3.5 CLEANING

A. Section 01740 - Cleaning: Final cleaning.

B. Clean engine and generator surfaces. Replace oil and fuel filters with new.

3.6 DEMONSTRATION AND TRAINING

A. Furnish 8 hours of instruction each for two persons, to be conducted at project site with manufacturer's representative.

B. Describe loads connected to emergency and standby system and restrictions for future load additions.

C. Simulate power outage by interrupting normal source, and demonstrate system operates to provide emergency and standby power.

END OF SECTION

SECTION 16722
ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. This performance specification provides the minimum requirements for the Electronic Access Control System. The System shall include, but not be limited to all equipment, materials, software, labor, documentation, training and services necessary to install a complete, operational system.

B. Provide an extension of the existing ~~Campus-wide~~ Ingersoll Rand (IR) Schlage Electronic Access Control and Security Management System (SMS) managed by the Offices of Maintenance/Operations and Information Technology using IP network protocol from their offices. The SMS shall be capable of expansion to include local management of all campus buildings with distributed client workstations as required.

C. This system shall be an Electronic Access Control Management and Security Management System, integral in nature, such that all capabilities utilize a single, industry standard Microsoft SQL relational database management system for the storage and manipulation of related data. The system shall have the capability to provide the following services from this integral database:

1. Electronic Access Control.

2. Alarm Management.

3. Dynamic Graphic Maps.

4. Remote Site Monitoring and Control.

5. CCTV and Digital Video Recording.

6. Photo ID and Badging.

7. Management Reports.

8. Management of off-line Schlage CM Locks and Networked, Wireless or Wired Schlage Access Control from the same SMS Software and Database.

1.2 WORK INCLUDED

A. The work shall include furnishing all labor, materials, tools, training, database input, assistance to the District for Cardholder programming, equipment, software and documentation required for a complete and fully functional Access Control and Security Management System as specified in this Section. The System shall comply in all respects with all pertinent codes, rules, regulations, and laws of the local jurisdiction.

B. The Contractor shall provide an extension ~~of~~ to the existing Antelope Valley College (AVC) Schlage Security Management System (SMS). Schlage SMS ~~Premier~~ Enterprise Version, with 5 Client workstation capability is existing on the AVC Campus and is the Campus Standard for electronic access control.

C. The Schlage SMS software shall be capable of managing and integrating the existing Schlage CM Locksets and the specified on-line electronic access control devices from within the same SMS database.

D. The Contractor shall be responsible for all database programming of Controllers, Doors, Monitoring Inputs, Time Scheduled Programmed Doors; and shall provide assistance to the District with cardholder data entry for a full and completely operational system.

E. The Contractor shall be responsible for creating a dynamic graphic map for ~~the~~ any building in the project. The District will provide Building Floor Plans in a digital format and the Contractor shall create and implement icons for monitored doors, programmed doors, and card reader access doors to dynamically display system status for ~~the~~ each building.

F. The Contractor shall be responsible for coordinating with Section 08710, ~~Finish~~ Hardware. Section 08710 shall provide some items of door hardware for use by the System, including certain door position switches, power transfer hinges, ~~power supplies, electric locks, electric trim, electric~~ panic hardware~~, power supplies for electric latch retraction panic hardware (EL)~~ and request-to-exit switches as required. The Contractor shall be responsible for reviewing and coordinating with the ~~Finish~~ Hardware Section and Architectural Door Schedule to provide a complete, functioning installation. Section 08710 and it's Hardware Sets shall determine where and for which doors, the Schlage AD Series Electronic Lock/Trim or a Schlage card reader will be furnished and installed by this Section. All required low voltage power for the specified Schlage AD Locks and Schlage card readers shall be the responsibility of this Section. Any required power supplies for the specified Panic Exit Hardware shall be the responsibility of Section 08710.

G. The SMS shall manage District provided HID compatible 125khz proximity access cards.

H. The SMS system shall provide free egress from access-controlled areas with no special knowledge or skill required for exiting the controlled space.

I. The Contractor shall ~~provide~~ furnish and install a proximity card reader at each of the doors as shown on the Construction Drawings and / or as described and specified in these documents~~,~~ and Section 08710, and the Architectural Door Schedule.

J. The Contractor shall wire and integrate all door position switches, request-to-exit ~~devices, electrified locking devices,~~ switches and accessories devices provided by Section 08710 and this Section for a complete operational installation.

K. The Contractor shall provide a minimum of 8 hours of System Administration / Operator training for AVC personnel.

L. The Contractor shall be a Certified Ingersoll Rand System Integrator certified to the ~~appropriate~~ "Enterprise Level" for the specified system.

M. The Contractor shall be responsible for all low voltage electrical installation required for a complete and operational system. All required 120 VAC wiring and conduit shall be furnished and installed by the Project Electrical Contractor.

N. Access Controller Panels shall be mounted in selected IDF/Data Rooms. The Project Electrical Contractor shall provide a 120 VAC circuit for power and a Network Data Drop for each Access Controller Panel.

1.3 RELATED WORK

A. General Terms and Conditions under Section 1 of the Contract Documents.

B. Section 08710 Door Hardware.

1.4 QUALITY ASSURANCE

A. The equipment supplied shall be a standard labeled product of the equipment manufacturer, bearing the company name and having their exclusive model numbers. This company must be of established reputation and experience, regularly engaged in the manufacture, supply and support of such systems. This company shall have a fully staffed office of sales and IR Certified technical support representatives within four hours travel time to the project.

1.5 REFERENCES

A. Design and operation of the system shall conform to the following referenced codes, regulations and standards as applicable.

1. California Electrical Code (CEC).
2. UL 294.
3. FCC Rules and Regulation.
4. Part 15, Radio Frequency Devices.
5. National Electrical Manufacturers Association (NEMA).
6. Section 250 Enclosures for Electrical Equipment.
7. Applicable Federal, State, and Local laws, regulations, and codes.

1.6 ABBREVIATIONS

A. The following abbreviations are used in this document:

1.	ANSI	American National Standards Institute.
2.	ASCII	American Standard Code for Information Interchange.
3.	AWG	American Wire Gauge.
4.	CEC	California Electrical Code.
5.	FCC	Federal Communications Commission.
~~6.~~	~~ID~~	~~Identification.~~
~~7.~~6.	IEEE	Institute of Electrical Code.
~~8.~~7.	NEMA	National Electrical Manufacturers Association.
~~9.~~8.	WS SMS	Client Operator Workstation.
~~10.~~9.	SMS	Security Management System.
~~11.~~10.	UL	Underwriters' Laboratories.

1.7 RESPONSE TO SPECIFICATION

A. The Contractor shall submit a point-by-point statement of compliance with all relevant sections defined herein. Where the proposed system complies fully with all numbered paragraphs as written, such shall be indicated by placing the statement “fully complies, plans and specifications complete” on the statement of compliance.

B. Where the proposed system does not comply with the paragraph as written, but the Contractor feels it will accomplish the intent of the paragraph in a manner different from that described, a full description of the intent perceived by the Contractor shall be provided as well as a full description of how the proposal will meet its perceived intent.

C. Where a full description is not provided, it shall be assumed that the proposed system does not comply with the paragraph in question.

D. Documentation in support of substitute equipment shall qualify all parameters with tangible values and benefit to Antelope Valley College in the response notations or on the manufacturer’s original data sheets. Submissions documents not using this type of statement shall be considered non-compliant.

1.8 SUBMITTALS

A. Contractor shall submit all items in accordance with the requirements of Section 01300, “Submittal Procedures”, and shall include, but not be limited to the following:

1. Model numbers of all components furnished on the job.

2. Manufacturer’s catalog data sheets for all components.

3. Input power requirements for all components.

4. Complete engineered drawings indicating:

a. Manufacturer model numbers and specifications.

b. Dimensions, layouts, installation details.

c. Point-to-point wiring diagrams for all devices.

d. Termination details for all devices.

B. Single-line system architectural drawings representing the entire system.

C. AVC acceptance form with a check box associated with each card reader and input point to indicate that each point was checked off as properly installed and reporting back to the control panel and the host computer prior to District acceptance of the system.

D. 2 sets of the Manufacturer’s User’s Manuals and Installation Manuals.

PART 2 - PRODUCTS

2.1 SUMMARY

A. The Schlage Security Management System (SMS) shall be capable of integrating multiple building functions including access control, alarm management, intrusion detection, CCTV and digital video recording, and Photo ID badging.

B. The system shall be at the time of bid, listed by Underwriters Laboratories for UL 294 Access Control Systems. Unlisted systems are unacceptable. All control panels furnished on the job shall carry the UL 294 labels.

C. The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of control panels, card readers, and sensors.

2.2 OPERATIONAL REQUIREMENTS

A. Scope of Work:

1. General:

a. All Schlage SMS software required to provide and perform the specified system functions is currently existing on the AVC Campus.

b. Schlage SMS Software, ~~Premier~~ Enterprise Level, 5-Client version, Schlage Part No. ~~SPRE~~ SENT-SFT-5 is the Campus Standard for Electronic Access Control.

c. The Contractor shall furnish and install Client Workstation Software on District provided Workstations, at locations determined by AVC.

d. The Contractor shall furnish all labor required to create a dynamic graphic map for each building within the project. The District will provide the Contractor with a digital graphic floor plan of each building and the Contractor shall create and implement graphical icons to represent card reader, monitored and programmed doors and their individual status, and integrate the graphics into the SMS.

2. Database Management: The system shall create and maintain a master database of all cardholder records and all system activity for all connected points.

3. Audit Trail: The system shall maintain an audit trail file of operator activity. Provide the ability to generate a report by operator, time and data, and type of activity ~~(audit code)~~. The system shall allow the operator to direct the audit trail report to screen, printer, or file.

4. Input point monitoring: Collect and process status information from all monitored points.

5. Alarm annunciation: Audibly and visually annunciate all alarm, tamper and trouble conditions, and advisories.

6. Input point supervision: The system shall electrically supervise all 2-state and 4-state input point circuits as specified or shown on the Drawings.

7. Reports: The Schlage SMS shall be equipped with a fully integrated, dynamic report writer module that shall have access to the SMS database fields to allow users to create

custom reports without the need for computer programming skills. The Schalge SMS shall be provided with a complete library of standard reports.

8. On-line help system: The system shall provide on-line, context sensitive help that shall be available at anytime and from any screen.

9. Passwords: The operator password function shall control which menu items and cardholder database fields that the individual operator may access. It shall be possible to restrict access to individual cardholder database fields such that certain operators may view and edit individual fields while other operators may only view the fields. It shall also be possible to restrict password holders such that certain specified fields and/or menu commands do not appear on the screen, or are grayed-out (disabled) for a given password.

10. Alarm Input Point Reporting Delay: The system shall allow the operator to apply an input point reporting delay period from 0 – 60 seconds for each input point terminal. The default setting for each input point reporting delay shall be 0 seconds.

11. Alarm Input Point Suppression: The system shall provide an alarm input point suppression facility such that the operator may define a time zone suppression period for each individual input point. Alarm conditions for suppressed input points shall not be recorded or archived by the system.

B. Time Zones:

1. The SMS shall provide the capability for the user to define time zones with the following identification and configuration parameters.

   a. Name.

   b. Description.

   c. Allowance for any number of time zone periods, during each day of the week and each of the different holiday types.

   d. Any number of days of the year may be designated as a holiday, each defined as one of any holiday types.

C. Communications:

1. Should the controller lose communications with the Host Server or Network, the controllers shall continue to control access and monitor inputs for all connected points. Local history of all transactions shall be buffered at the controller and automatically uploaded to the Schlage SMS Server for alarm reporting and long-term historical storage once communications are re-established.

2. In the event of a total failure of the controller, the connected card readers shall continue to operate and make access control decisions based on a common facility code encoded in each access control card for the given facility.

3. The Contractor shall be responsible for the design of a system that will compensate for all signal level losses in the trunk wiring. This shall include any power supplies for the field devices and any signal level converters or repeaters for the proper amplification of electrical signals.

~~3.~~4. User defined cardholder database fields: The system shall support unlimited user defined data fields that may be used to store information for each cardholder. The SMS shall provide standard menu items that shall allow the operator to define these cardholder database field at anytime. The system shall remain on-line while user defined cardholder database fields are added or edited. It shall be possible, using standard SMS system menu commands to search and report on all user defined cardholder fields.

~~4.~~5. Event and Transaction History: The SMS shall maintain a record of all alarm, card transaction, and system exceptions which take place, and provide a means for a user to access this information. It shall be possible to print information in the log in real-time or by a report.

~~5.~~6. Anti-Passback Control: The SMS shall provide the capability to prevent more than one person from gaining access to a controlled area by recognizing when a cardholder who is granted access is passing back the card to another person to use the same card to gain access. An alarm shall be generated if the cardholder violates the anti-passback rules. It shall be possible to define on a reader-by-reader basis, which readers are subject to anti-passback rules.

~~6.~~7. Entry/Exit Control: The SMS shall provide the capability to control a card's entry into or exit from an area based on the cards previous transaction status.

~~7.~~8. Cardholder Definition: The SMS shall provide the capability for the user to define Cardholders with the following identification and operating parameters.

a. Cardholders name (first, middle, last).

b. Cardholders address.

c. Cardholder phone number.

d. Activation period using start and end dates.

e. Trace enabled or disabled.

f. Override enabled or disabled,

g. PIN code.

h. Assigned access cards.

i. Unlimited user defined cardholder fields. The SMS shall provide the capability to use these fields in filtering reports.

~~8.~~9. System Status Display: The SMS shall provide a dynamic system status summary display that graphically indicates the status information filtered by communications loop, controller, or Workstation. All status display information shall be summarized in a single window.

~~9.~~10. Alarm routing: The SMS shall provide the ability for the user to define which input points or groups of input points are routed to each SMS Operator Workstation (WS) computer. The system shall provide a report showing which input points are routed to each WS.

~~10.~~11. Control points: The SMS shall provide the ability to define input points as control points to be used in input/output linking and event processing sequences of operation. Control points shall not enter the alarm queue and shall not require that an operator acknowledge

them when they change state. The control point activity will however, be automatically logged to the history file.

2.3 SOFTWARE REQUIREMENTS

A. The Client WS operating system shall be Microsoft Windows 2000 or XP Professional software.

1. The SMS software features shall be fully documented in the form of a complete user's manual including operation and installation sections, and a detailed description of the major SMS functions.

2. The Contractor shall load SMS Client software on District provided workstations as directed by the Office of Maintenance and Operations.

2.4 INTEGRATION REQUIREMENTS

A. The card access system must be compatible with off-line, battery-powered Schlage CM Locks, Schlage Wireless Access Modular Locksets, Schlage VIP Locksets, Schlage AD Series Locks and hardwired, networked HID compatible card readers, all managed from a common SMS database.

2.5 HARDWARE REQUIREMENTS

A. The SMS Client workstation computer shall be an District provided standard personal computer with proper capacity for the intended purpose. The SMS software shall be loaded, configured, and tested by the Contractor.

B. Controllers shall be IR Schlage-SRCNX Access Controller with SRINX reader interfaces as required.

1. The Controller shall be a fully stand-alone processor capable of making all access control decisions without the involvement of the host computer.

2. The Controller shall support up to 16 card readers in addition to auxiliary input points and output points.

3. Memory Requirements:

a. Minimum number of cards: 20,000.

b. Minimum number of historical transactions: 10,000.

c. The controller(s) shall be provided with an IP-Addressable module to connect to the AVC Campus network for communication. A network drop for Controller connection to the system shall be provided for the Contractor at the ~~designated~~ designed location for installation of the Controller. Schlage Part No. SIPNX-100 IP Addressable Module.

d. A SPDT tamper switch shall be attached to the inner surface of the controller enclosure. The tamper switch shall change state whenever the enclosure door is opened to signal the SMS of the condition. ~~The tamper switch input shall be user programmable to be suppressed, to be recognized as an input point to be processed by the alarm queue at the host computer.~~

e. The standard AC linear power supply version of the controller shall include a battery module to back-up the controller's applications programs and database upon the failure of the primary AC power service. Additionally, the Contractor shall provide a minimum of 4 hours of stand-by battery operation for the controller Schlage part No. S400-NX.

f. The controller shall provide built-in LED's that indicate whether or not the controller is continuing to process event activity, card transactions, and record history transactions.

~~g.Provide the controllers and associated accessory devices in sufficient quantities to manage all card readers and monitoring inputs required for the project.~~

~~h.~~g. Controllers shall be mounted in designated building IDF/Communication Rooms.

C. Access Control Schlage AD Electronic Locks and Card Readers: All card access controlled doors shall be configured with a proximity card reader at each door as shown or described within the Construction Documents~~ and the Architectural Door Schedule~~. In general, any door whose Section 08710 Hardware Set specifies a "card reader" to be provided by Section 16722", shall be hardwired into the SMS system using a Reader Interface Module and a Schlage Proximity Card Reader. Doors whose Section 08710 Hardware Set specifies an "Electronic Lock" or "Electronic Exit Trim" to be provided by Section 16722, shall have an Schlage AD-300 Electronic Lock or Trim furnished and installed by this Section with integration of the AD Lock/Trim's integral door position switch, request to exit switch and proximity card reader. Refer to Section 08710 for details and door locations.

D. Proximity Technology Card Readers and Schlage AD Series Electronic Locks:

1. Proximity technology card readers shall be HID compatible, operate at 125 KHZ, with a read-range of 2"-4" on center and shall be manufacturer certified for an ambient operating environment of –22 to 150 deg. F and 0 to 95% RH, non-condensing.

2. The reader shall contain a tri-color LED and audible signal to indicate valid and invalid card reads and shall be weatherized for outdoor use.

3. All Doors whose respective Hardware Set specifies a "Card Reader" by Section 16722, shall have a Schlage Multi-Technology Reader furnished, installed, and integrated into the SMS. The Contractor shall also integrate the door position switch, request-to-exit switch and lock control output for the provided electrified exit/panic device. Schlage Part No. SFX-1500 Wall Mount Reader. For Doors with limited wall mounting space, a mullion mount reader may be furnished and installed. Schlage Part No. SXF1100 Multi-Technology Mullion Reader.

4. Schlage AD 300 Series Hardwired Electronic Locks/Exit Trim shall contain all of the elements needed to electronically monitor and control access through the door via an RS-485 Communications Link. The AD-Series Lock/Trim shall combine all the hardware components required at the door for a complete access control solution that includes an electrified lock, request-to-exit switch, a door position switch, a credential reader, and a tamper switch. It shall be UL listed to UL 294 and be compliant with the Americans with Disabilities Act. The Contractor shall be required to provide the Schlage AD-300 Electronic Locksets/Trim for entry into controlled spaces, as designated and described in the contract documents. The Contractor shall determine the proper model required (Mortise, Cylindrical or Exit Device Trim) by coordinating with Section 08710 and the respective door's Hardware Set.

a. Where Section 08710 specifies an Electronic Exit Trim RIM to be provided by Section 16722, this Section shall furnish and install Schlage Model: AD-300-993R-70-PR-RHO-626-JD, and integrate it into the SMS.

b. Where Section 08710 specifies an Electronic Exit Trim SVR to be provided by Section 16722, this Section shall furnish and install Schlage Model: AD-300-993-S-70-PR-RHO-626-JD, and integrate it into the SMS.

c. Where Section 08710 specifies an Electronic Exit Trim MS to be provided by Section 16722, this Section shall furnish and install Schlage Model: AD-300-993M-70-PR-RHO-626-JD, and integrate it into the SMS.

d. Where Section 08710 specifies an Electronic Mortise Lock to be provided by Section 16722, this Section shall furnish and install Schlage Model: AD-300-MS-70-PR-RHO-626-JD, and integrate it into the SMS.

5. The Contractor shall furnish and provide to the Owner, one Hand Held Device to facilitate AD Electronic Lock configuration and trouble shooting. Schlage Part No. HHD Kit.

6. The Contractor shall furnish and install all low voltage power supplies required for the operation of AD Electronic Locks and Card Reader controlled doors. Doors equipped with electric panic/exit devices shall have their power supply furnished and installed by Section 08710. The Power Supplies for the AD Locks/Trim and Card Reader controlled doors shall deliver 24VDC power and have sufficient capacity to power all specified electronic devices. Manufacturer: Schlage Electronic, Altronix, or equal.

~~3.~~7. The College shall provide all required HID compatible proximity cards for use by the system.

~~4.The Contractor shall furnish and install low voltage door lock power supplies in sufficient quantity and size, to power all electric door locks and electric panic hardware trim (E-Trim) supplied by Section 08710. Manufacturer shall be Altronix, Schlage Electronic, or equal.~~

~~5.Power Supplies (PS-873) for the electric latch (EL) retraction panic hardware shall be furnished by Section 08710.~~

~~6.~~8. Proximity Card Readers and/or Schlage AD Locks/Exit Trim shall be provided by this Section for the locations shown on the Construction Drawings and as specified in Section 08710 and this Section. To include but not be limited to:

~~a.Card Reader/Programmed Doors (CR): All doors designated on the Architectural Door Schedule to be equipped with a card reader and operate on a time schedule shall be hardwired and integrated into the SMS by this Section. The Contractor shall furnish and install Model: Schlage Model SXF-1500 Multi-technology Wall Mount Reader. For doors with limited mounting space, the Contractor shall furnish and install a mullion style reader. Schlage Model No. SXF1100 Multi-Technology Mullion Reader. Refer to Section 08710 for details and door locations.~~

a. In the case of pairs of doors that have electronic access control and/or are to be monitored only, the Contractor shall monitor both of the doors and integrate request-to-exit switches and door position switches on both doors. Both leafs may be reported to the SMS in common as a single opening, rather than two monitoring inputs. Refer to Section 08710 for details and door locations.

b. Monitoring (M): All doors designated to be monitored ~~by~~ only on the ~~Architectural Door Schedule~~ architectural door schedule or within Section 08710 Hardware

Sets, shall have a door position switch provided by Section 08710 and shall be wired and integrated into the SMS for monitoring by this Section. Refer to Section 08710 ~~and the Architectural Door Schedule~~ for details and door locations.

c. Programmed (P): All doors designated as Programmed only on the Architectural ~~Door Schedule~~ door schedule or within Section 08710 Hardware Sets, shall have an electrical locking device provided by Section 08710 and shall be wired and integrated into the SMS for locked/unlocked programming by Time Schedule, ~~Programming~~ by this Section. Refer to Section 08710 ~~and the Architectural Door Schedule~~ for details and door locations.

2.6 DELIVERY, STORAGE AND HANDLING

A. SMS components shall be shipped to the job-site in original manufacturer's shipping containers.

B. All shipping and handling costs shall be paid for by the Contractor.

C. All equipment stored on the job site shall be secured in a locked storage area as designated by the Contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All electronic equipment, terminals, and controllers shall be factory wired prior to shipment to the jobsite.

B. The ~~Project~~ Electrical Contractor shall provide all required conduit and 120 VAC for the system.

C. Provisions shall be made for field wiring to enter the cabinet via standard knockouts at the top and bottom of controller cabinets.

D. All exposed wiring within the cabinets, consoles, and terminals shall be formed neatly with wires grouped in bundles using non-metallic, flame-resistant wiring cleats or wire ties.

3.2 TESTING AND COMMISSIONING

A. The Contractor shall be responsible for testing and commissioning of the installation in accordance with all applicable documents in the Contract set.

1. Testing shall be comprehensive and sufficient to demonstrate compliance with each requirement.

2. A proposed test plan shall be submitted to AVC for approval prior to commencement of final test.

B. Final Tests shall be conducted in the presence of the Contractor and the District's Administration and Facilities personnel.

3.3 TRAINING AND INSTRUCTION

A. Operator training shall consist of 8 hours of training conducted on-site by a factory trained professional instructor.

B. Additional equipment and training sessions shall be made available to the District, if necessary, at additional cost.

3.4 WARRANTY

A. All equipment furnished under this contract shall be warranted for a period of 12 months from the date of final acceptance of the system. The warranty shall include all material, labor, and travel expenses to:

1. Respond to service requests on-site, within 24 hours.

2. Replace or repair defective components as required.

END OF SECTION