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November 17, 2017

ADDENDUM NO. 1:

TO: All Prospective Bidders

RE: Columbia County, Georgia
Columbia County Performing Arts Center
Evans Town Center, GA 30809
CGD Project No. 15023

To whom it may concern:

Please note the following changes or clarifications that shall become part of the contract documents for the above referenced project.

GENERAL:

- A1-G1 **TABLE OF CONTENTS:**
Replace: Table of Contents (TOC) with the attached revised Table of Contents.
Several section titles were corrected on the TOC to match individual section titles.
Several section numbers were corrected on the TOC to match individual section numbers.
- A1-G2 **TABLE OF CONTENTS:**
Georgia Security and Immigration Compliance Act – Not found in Project Manual.
Contractor Affidavit and Agreement – Not found in Project Manual.
Contractors shall complete online forms provided on BidSync.com for submitting with bid.
- A1-G3 **01020 – General Requirements, 1.11.2 Substitutions, item (f):**
Add: “Proposed Substitution Request Form” form attached.

SPECIFICATIONS:

- A1-S1 **DRAFT AIA Doc. A101, paragraph 11.1.2.1.C Insurance Requirements, item 6:**
Revise Excess Limits Liability Policy (Umbrella) from \$2,000,000.00 **to** \$32,000,000.00
- A1-S2 **01230 – Alternates, Alternate #1:**
Delete: “furnish and install”.
Add: “delete from the scope of work”.
Clarification: The intent is to define a deductive alternate. The bid form will be revised to reflect this change and be re-issued with the final addendum.
- A1-S3 **057313 – Glazed Decorative Metal Railings:**
Replace: With enclosed section 057313.
- A1-S4 **061600 - Sheathing:**
Replace: With enclosed section 061600.
- A1-S5 **062023 – Interior Finish Carpentry, 2.2.A Hardwood Lumber Trim for Transparent Finish:**
Delete: White Maple.
Add: Quarter-sliced cherry.
- A1-S6 **071113 – Bituminous Dampproofing:**
Replace: With enclosed section 071113.

- A1-S7 **072411 – Direct Applied Exterior Finish System (DEFS):**
Delete Entire section. DEFS is not used.
- A1-S8 **072419 – Water Drainage Exterior Insulation and Finish System (EIFS):**
Replace: With enclosed section 072419
- A1-S9 **072726 – Fluid Applied Membrane Air Barriers:**
Replace: With enclosed with enclosed 072726.
- A1-S10 **074213.23 – Metal Composite Material Wall Panels, B.3.a:**
Delete: Three colors, refer to drawings.
Add: Match clear anodized aluminum curtain wall.
- A1-S11 **075419 - PVC Roofing, 2.3.A.1 Products:**
Clarification: Product by Sarnafil is the Basis-of-Design.
Add: b. Seaman Corporation; FiberTite
c. Duro-Last, Inc.
- A1-S12 **077100 – Roof Specialties:**
Replace: With enclosed section 077100.
- A1-S13 **077200 – Roof Accessories, 2.5.A, Hatch-Type Heat and Smoke Vents, item 7 Hardware:**
ADD: "a. Manual release cables from each stage smoke vent shall extend to stage level with pull handles grouped on the upstage wall."
- A1-S14 **077200 – Roof Accessories, 3.2.F Heat and Smoke Vent Installation:**
ADD: " 3. Test and adjust release cable operation from the stage level. Coordinate with theatrical rigging to assure release cables are installed above rigging without contact or interference from the heat and smoke vents to the upstage wall and down to the release pull handles with appropriate cable guides to provide smooth operation. Resetting of smoke and heat vents shall be from the gridiron level."
- A1-S15 **078413 – Penetration Firestopping, 1.4.B:**
Delete: "M104"
Add: "M014"
- A1-S16 **081113 - Hollow Metal Doors and Frames, 2.6 Custom Hollow Metal Doors:**
Add: H. Hanging Hardware: The Custom Hollow Metal Door Supplier shall provide the required type of hanging hardware to properly hang the doors. See Section 087100 for latching hardware.
- A1-S17 **083473.13 – Sound Control Door Assemblies:**
Delete: Entire section. Refer to sections 081113 and 081416 for doors.
- A1-S18 **083473.53 - Acoustical Gaskets:**
Delete: Entire section. Refer to section Division 08 section "Door Hardware" for acoustical gaskets.
- A1-S19 **087100 – Door Hardware:**
Add: Enclosed section with schedule of door hardware.
- A1-S20 **116161 – Performance Lighting Power and Controls**
Add: attached Equipment and Component schedule: 116161.99
- A1-S21 **116161 – Orchestra Pit Platforms**
Add 1.2 (D) 7: "Protective Net"
Add 2.4 (G) Horizontal safety net
1. Provide a manual demountable safety net filling the orchestra pit opening when the lift is at a lowered position.
2. Provide an opening panel for conductor.
3. Construct of 3/16" diameter cord, constructed in a 2-1/2" mesh.
4. Bind the perimeter with 1/2" rope, hemmed.
5. Provide rated snap hooks for attachment to railings and structure.
6. Provide InCord Tensioned Orchestra Pit Safety Net.
- AV1-S22 **116139 – Performance Lifts**
Add 1.1 (B) 4: "Vertical barrier net along the upstage edge of the lift with accompanying storage trough at the Machinery Level."

Add 2.2 (F) Horizontal safety net

1. Provide a manual demountable safety net filling the orchestra pit opening when the lift is at a lowered position.
2. Provide an opening panel for conductor.
3. Construct of 3/16" diameter cord, constructed in a 2-1/2" mesh.
4. Bind the perimeter with 1/2" rope, hemmed.
5. Provide rated snap hooks for attachment to railings and structure.
6. Provide InCord Tensioned Orchestra Pit Safety Net.

A1-S23 **23 0601 – Hydronic Specialties**

Revise the following:

1.3.D.3 3. The following coalescing air eliminator and dirt separator manufacturers are acceptable:

- A. Bell and Gossett
- B. Spirotherm
- C. Taco

2.6 COALESCING AIR ELIMINATOR AND DIRT SEPARATOR:

- A. The air separator shall be the centrifugal type and shall be constructed of steel in accordance with ASME standards and stamped for 125 PSIG at 270°F.
- B. Inlet and outlet connections to the air separator shall be threaded for pipe sizes 2-1/2 inches and smaller and flanged for all larger pipe sizes.
- C. Each unit shall have a separate venting chamber to prevent system contaminants from harming the float and venting valve operation. At the top of the venting chamber shall be an integral full port float actuated brass venting mechanism. Unit shall include a valved side tap to flush floating dirt or liquids and for quick bleeding of large amounts of air during system fill or refill.
- D. The unit shall be supplied with a 3rd party test report certifying that the unit can remove 99% or more of dissolved air and 96% or more of total suspended particulate.
- E. The unit shall have a threaded blowdown connection to allow for sediment to be regularly cleaned out of the unit.
- F. The unit shall have a removable cover to facilitate removal, inspection and cleaning of coalescing medium.

3.5 COALESCING AIR ELIMINATOR AND DIRT SEPARATOR:

AV1-S24 **274100 - AUDIO VIDEO SYSTEMS**

Replace the following appendix: APPENDIX B – MAJOR EQUIPMENT LIST

DRAWINGS:

A1-D1 **Civil Drawings**

Replace the following sheets as follows:

- C200 EXISTING CONDITIONS AND DEMOLITION PLAN
- C301 GRADING & STORM PLAN
- C302 UTILITY PLAN
- C500 PROFILES

A1-D2 **Life Safety Drawings**

Replace the following sheet as follows:

- LS101 CODE REVIEW AND LIFE SAFETY PLAN

A1-D3 **Architectural Drawings**

Replace the following sheets as follows:

- LS101 CODE REVIEW AND LIFE SAFETY PLAN
- A101 MAIN LEVEL FLOOR PLAN
- A102 FIRST BALCONY FLOOR PLAN
- A103 SECOND BALCONY FLOOR PLAN
- A104 CATWALK FLOOR PLAN
- A105 MISCELLANEOUS FLOOR PLANS
- A112 ENLARGED PLANS – LOBBY & RESTROOMS
- A113 ENLARGED PLANS – AUDITORIUM
- A114 ENLARGED PLANS – STAGE & DRESSING ROOMS

A121	PLAN DETAILS – AUDITORIUM
A201	DOOR SCHEDULE & LEGEND
A202	WINDOW LEGEND
A203	WALL TYPES
A204	WINDOW DETAILS
A301	EXTERIOR ELEVATIONS
A401	BUILDING SECTIONS
A402	BUILDING SECTIONS
A403	BUILDING SECTIONS
A404	BUILDING SECTIONS
A501	WALL SECTIONS – MUSEUM WING
A502	WALL SECTIONS – NORTH CONCOURSE
A503	WALL SECTIONS – BACK OF HOUSE
A504	WALL SECTIONS – MULTIPURPOSE AREAS
A505	WALL SECTIONS – MAIN LOBBY
A506	WALL SECTIONS – MAIN LOBBY
A507	WALL SECTIONS – WEST CONCOURSE
A508	WALL SECTIONS – STAGE HOUSE & AUDITORIUM
A511	WALL SECTIONS – BALCONIES & PARTERRE
A512	WALL SECTIONS – AUDITORIUM SIDE WALLS & BALCONIES
A513	WALL SECTIONS – ORCHESTRA PIT
A514	WALL SECTIONS – REFLECTORS & CATWALK
A515	LOBBY DETAILS
A520	ACOUSTICAL JOINT DETAILS
A700	FINISH SCHEDULE
A716	MILLWORK ELEVATIONS & PLANS
A801	MAIN LEVEL REFLECTED CEILING PLAN
A802	FIRST BALCONY REFLECTED CEILING PLAN
A803	SECOND BALCONY, CATWALK, & PIT RCP
A804	FIRST BALCONY ABOVE CEILING
A902	VERTICAL CIRCULATION
A907	STAIR DETAILS

A1-D4 **Structural Drawings**

Replace the following sheets as follows:

S100	STRUCTURAL NOTES
S101	STRUCTURAL NOTES
S201	FOUNDATION PLAN
S202	FOUNDATION PLAN
S310	CATWALK FRAMING PLAN
S501	AUDITORIUM ROOF FRAMING PLAN
S605	BUILDING SECTIONS
S700	FOUNDATION DETAILS
S701	FOUNDATION DETAILS
S702	FOUNDATION DETAILS
S703	FOUNDATION DETAILS
S901	FRAMING DETAILS
S906	FRAMING DETAILS

A1-D5 **Mechanical Drawings**

Replace the following sheets as follows:

M001	HVAC LEGENDS, NOTES, SYMBOLS AND SCHEDULES
M002	HVAC SCHEDULES
M003	HVAC SCHEDULES
M010	CHILLER PLANT PIPING SCHEMATIC
M011	HOT WATER PIPING SCHEMATIC
M014	HVAC DETAILS
M015	HVAC DETAILS
M101	HVAC PLAN – MECHANICAL ROOM
M102	HVAC PLAN – ORCHESTRA PIT AND MUSEUM
M103	HVAC PLAN – MAIN LEVEL
M104	HVAC PLAN – FIRST BALCONY
M105	HVAC PLAN – SECOND BALCONY
M106	HVAC PLAN – CATWALK
M107	HVAC PLAN – ROOF PLAN

M111 HVAC PIPING PLAN – MAIN LEVEL
M112 HVAC PIPING PLAN – FIRST BALCONY
M113 HVAC PIPING PLAN – SECOND BALCONY
M201 HVAC SECTIONS
M202 HVAC SECTIONS
M203 HVAC SECTIONS
M204 HVAC SECTIONS
M205 HVAC SECTIONS

Add the following sheets as follows:
M016 HVAC SECTIONS

A1-D6 **Fire Protection Drawings:**

Replace the following sheets as follows:

F001 NOTES, LEGENDS & ABBREVIATIONS – FIRE PROTECTION
F010 SITE PLAN – FIRE PROTECTION
F100 ORCHESTRA PIT FLOOR PLAN – FIRE PROTECTION
F101 MAIN LEVEL FLOOR PLAN – FIRE PROTECTION
F102 FIRST FLOOR BALCONY FLOOR PLAN – FIRE PROTECTION
F103 SECOND BALCONY FLOOR PLAN – FIRE PROTECTION
F104 STAGE LEVELS – FIRE PROTECTION
F105 MISCELLANEOUS FLOOR PLAN – FIRE PROTECTION
F401 STAIR 1 & 2 SECTIONS – FIRE PROTECTION
F402 STAIR 3 & 4 SECTIONS – FIRE PROTECTION
F501 ENLARGED RISER ROOM, DETAILS – FIRE PROTECTION

A1-D7 **Electrical Drawings**

Replace the following sheets as follows (all identified as Revision 1):

E002 POWER RISER DIAGRAM
E004 PANELBOARD SCHEDULE
E005 PANELBOARD SCHEDULE
E006 PANELBOARD SCHEDULE
E007 PANELBOARD SCHEDULE
E120 PARTIAL FLOOR PLANS –ARCHITECTURAL LIGHTING
E121 PARTIAL FLOOR PLANS –ARCHITECTURAL LIGHTING
E122 PARTIAL FLOOR PLANS –ARCHITECTURAL LIGHTING
E123 PARTIAL FLOOR PLANS –ARCHITECTURAL LIGHTING
E201 MAIN LEVEL FLOOR PLAN - ELECTRICAL
E203 SECOND BALCONY FLOOR PLAN - ELECTRICAL
E205 MECHANICAL AND ELECTRICAL EQUIPMENT ROOMS
E211 MAIN LEVEL FLOOR PLAN – THEATRICAL SYSTEM CONNECTIONS
E212 FIRST BALCONY FLOOR PLAN - THEATRICAL SYSTEM CONNECTIONS
E213 SECOND BALCONY FLOOR PLAN - THEATRICAL SYSTEM CONNECTIONS
E214 CATWALK & ORCHESTRA PIT FLOOR PLANS – THEATRICAL SYSTEM CONNECTIONS
E300 IT DETAILS
E301 MAIN LEVEL FLOOR PLAN - IT
E302 FIRST BALCONY FLOOR PLAN - IT
E401 FLOOR PLAN – FIRE ALARM

A1-D8 **Theatre Drawings**

Replace the following sheets as follows:

QTR103 Theatre Rigging Plans
QTR201 Theatre Rigging Sections
QTL101 Theatre Rigging Plans
QTL3.00 Performance Lighting Control Riser

A1-D9 **Drawing QTR401, Theatre Rigging Schedules**

Revise Acoustic Curtain Schedule (A4) as follows: Change Fabric Height of AD6 to 10'-6".

Revise Acoustic Curtain Schedule (A4) as follows: Change Fabric Height of AD7 to 9'-0".

Revise Acoustic Curtain Schedule (A4) as follows: Change Fabric dimension of AD8 to 11'-3" high by 81'-0" wide

Revise Acoustic Curtain Schedule (A4) as follows: Change Fabric dimension of AD9 to 11'-3" high by 81'-0" wide

Revise Loose Rigging Equipment Schedule (B4) as follows: Add to the schedule (30) Torm Pipe Section, 1-1/2" Schedule 40, 46-inches in length, black, (note: Confirm dimension in field); (60) 90-

degree fixed 1-1/2" Coupler (note: ML9B or Approved Equal).

A1-D10 **Drawing EYM103, Theatre Electrical Machinery Plans**
Modify Detail A1 to indicate Box 940 MCP Motor Control Panel near the Stage Right (west) end of house/apron catwalk 1, adjacent to stairs.

A1-D11 **AV Drawings**
Replace the following sheets as follows:
AV032 AV SIGNAL FLOWS 2
AV036 AV SIGNAL FLOWS 6
AV201 AUDITORIUM LOUDSPEAKER
AV806 PLATES AND PANELS

APPROVED EQUALS

The following manufacturers have been given prior approval for bidding, subject to plans and specifications. Manufacturer's grades, weights, finishes or qualities shall equal or exceed those specified items.

Product	Specification Section	Manufacturer
Variable Refrigerant Flow	23 9005.2	York/JCI

ENCLOSURES

Proposed Substitution Request Form
Specification sections as noted above (CCPAC Addendum 1 file 1of2_specs.pdf)
Drawings as noted above (CCPAC Addendum 1 file 2of2_drawings.pdf)

END OF ADDENDUM NO. 1

CRAIG GAULDEN DAVIS, INC.

David L. Dixon, AIA
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Enclosures as Noted

**COLUMBIA COUNTY PERFORMING ARTS CENTER
EVANS, GEORGIA**

ARCHITECT'S PROJECT NO. 15023

SPECIFICATION INDEX

DIVISION NUMBER	SECTION NUMBER TITLE
	Seals Page Specification Index
00	Procurement and Contracting Requirements
	IB 1 Invitation to Bid
	BI 1-5 Bidder's Information
	BF 1-3 Bid Form
	BQ 1-2 Bidder's Qualifications
	DRAFT - AIA Doc. A201 – 2007 General Conditions of the Contract for Construction
	SAMPLE - Insurance Certificate
	DRAFT - AIA Doc. A101 – 2007 Standard Form of Agreement b/ Owner and Contractor
	DRAFT - AIA Doc. A310 – 2010 - Bid Bond
	DRAFT - AIA Doc. A312 – 2010 Payment Bond
	Report of Geotechnical Investigation (for information)
01	General Requirements
	01020 General Requirements
	011000 Summary
	01200 Project Meetings
	01210 Allowances
	012200 Unit Prices
	01230 Alternates
	01300 Submittals
	01675 Change Procedures
	01700 Project Closeout
	01750 Project Warranties
	01770 Project Cleanup
02	Existing Conditions and Site Control
	02030 Construction Site Traffic, Safety and Security Control
03	Concrete
	033000 Cast-In-Place Concrete
04	Masonry
	042000 Unit Masonry
	047200 Cast Stone Masonry

Specification Index

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	051200	Structural Steel Framing
	052100	Open Web Joists
	053100	Metal Decking
	055000	Metal Fabrications
	055113	Metal Pan Stairs
	055213	Pipe and Tube Railings
	057000	Decorative Metal
	057113	Fabricated Metal Spiral Stairs
	057313	Glazed Decorative Metal Railings
06	Wood, Plastics and Composites	
	061053	Miscellaneous Rough Carpentry
	061600	Sheathing
	062023	Interior Finish Carpentry
	064116	Plastic-Laminate-Faced Architectural Cabinets
07	Thermal and Moisture Protection	
	071113	Bituminous Dampproofing
	071326	Self-Adhering Sheet Waterproofing
	072100	Thermal Insulation
	072419	Water-Drainage Exterior Insulation and Finish System (EIFS)
	072623	Under-Slab Vapor Retarder
	072726	Fluid-Applied Membrane Air Barriers
	074213.23	Metal Composite Material Wall Panels (ACM)
	075419	Polyvinyl-Chloride (PVC) Roofing
	076200	Sheet Metal Flashing and Trim
	077100	Roof Specialties
	077200	Roof Accessories
	078100	Applied Fireproofing
	078413	Penetration Firestopping
	078446	Fire-Resistive Joint Systems
	079200	Joint Sealants
	079500	Expansion Control
08	Openings	
	081113	Hollow Metal Doors and Frames
	081416	Flush Wood Doors
	083113	Access Doors and Frames
	083323	Overhead Coiling Doors
	084113	Aluminum-Framed Entrances and Storefronts
	084413	Glazed Aluminum Curtain Walls
	085113	Aluminum Windows
	085653	Security Windows
	087100	Door Hardware
	088000	Glazing
	088300	Mirrors
	088813	Fire-Resistant Glazing
089119	Fixed Louvers	

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09	Finishes	
	092116.23	Gypsum Board Shaftwall Assemblies
	092216	Non-Structural Metal Framing
	092900	Gypsum Board
	093013	Ceramic Tiling
	095113	Acoustical Panel Ceilings
	096513	Resilient Base and Accessories
	096543	Resilient Wood Flooring
	096623	Resinous Matrix Terrazzo Flooring
	096813	Tile Carpeting
	096816	Sheet Carpeting
	097200	Wall Coverings
	097713	Stretched-Fabric Wall Systems
	097723	Fabric-Wrapped Panels
	099113	Exterior Painting
	099123	Interior Painting
	099300	Staining and Transparent Finishing
	099600	High-Performance Coatings
10	Specialties	
	101419	Dimensional Letter Signage
	102113.17	Phenolic-Core Toilet Compartments
	102600	Wall and Door Protection
	102800	Toilet, Bath, and Laundry Accessories
	104413	Fire Protection Cabinets
	104416	Fire Extinguishers
	107316	Manufactured Aluminum Canopies
	107516	Ground-Set Flagpoles
11	Equipment	
	111313	Loading Dock Bumpers
	116100	Performance Machinery General Requirements
	116123	Orchestra Pit Platforms
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	116133	Performance Manual Rigging
	116135	Performance Rigging Speaker Hoist
	116136	Seating Wagons
	116137	Proscenium Fire Safety Curtain
	116139	Performance Lifts
	116143	Performance and Acoustic Draperies
	116144	Performance Drapery Tracks
	116161	Performance Lighting Power and Controls
	116161.11	Architectural Controls
	116161.20	Performance Control Console
	116161.30	Company Switch Subsection
	116161.40	Data Communications
	116161.51	Phase Control Dimmers
	116161.53	Controlled Motorized Breaker Panel
	116161.55	Surge Suppression
	116161.60	Emergency Lighting Transfer Switch

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	116161.61	DMX Emergency Bypass Controller
	116161.62	Emergency Bypass Detection Kit
	116161.64	Branch Circuit Emergency Lighting Transfer Switch
	116161.71	Control Faceplates
	116161.72	Power Faceplates
	116161.73	Busway Subsection
	116161.74	Remote Control High Amperage Switch
	116161.80	Stair Edge Marking System
	116161.99	Equipment and Component Schedule
12	Furnishings	
	122113	Louwer Blinds
	123623.13	Plastic-Laminate-Clad Countertops
	123661.16	Solid Surfacing Countertops
	126100	Fixed Audience Seating
	129300	Site Furnishings
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	Not Used	
14	Conveying Equipment	
	142020	Wheelchair Lifts
	142100	Electric Traction Elevators
21	Fire Suppression	
	21 0500	General Fire Suppression Requirement
	21 0501	Common Work Results For Fire Suppression
	21 0507	Penetration Firestopping
	21 0510	Documentation and Closeout
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	21 0553	Identification for Fire Suppression Piping and Equipment
	21 1300	Fire Suppression Sprinkler and Standpipe Systems
	21 3113	Electric-Drive, Centrifugal Fire Pumps
	21 3400	Pressure-Maintenance Pumps
	21 3900	Controllers for Fire-Pump Drivers
22	Plumbing	
	22 0500	General Plumbing Requirements
	22 0501	Common Plumbing Materials
	22 0505	Trenching and Excavation
	22 0507	Firestopping and Smokestopping
	22 0510	Documentation and Closeout
	22 0511	Submittals
	22 0513	Common Motor Requirements for PLB Equipment
	22 0514	Variable Frequency Drives and System
	22 0515	Controllers, Starters, and Electrical Work
	22 0517	Sleeves, Seals, and Escutcheons

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22 0519	Meters and Gauges for Plumbing Piping
22 0523	General-Duty Valves for Plumbing Piping – “Lead Free”
22 0529	Hangers and Supports for Plumbing Piping
22 0548	Vibration and Seismic Control for Plumbing
22 0553	Identification for Plumbing Piping and Equipment
22 0592	System Start Up
22 0601	Hydronic Specialties
22 0700	Plumbing Insulation
22 0716	Plumbing Equipment Insulation
22 0719	Plumbing Piping Insulation
22 1100	Plumbing Piping
22 1123	Plumbing Pumping Systems
22 3300	Electric Domestic Water Heaters
22 3400	Fuel Fired Domestic Water Heaters
22 4011	Plumbing Accessories
22 4013	Plumbing Fixtures (General)
22 4100	Plumbing Fixtures (Sinks and Lavatories)
22 4200	Plumbing Fixtures (Shower and Tubs)
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22 4400	Plumbing Fixtures (Water Fountain and Water Coolers)
23	Heating, Ventilating and Air Conditioning
23 0501	General HVAC Requirements
23 0502	Common HVAC Materials
23 0505	Trenching & Excavating
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23 0510	Documentation and Closeout
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23 0513	Common Motor Requirements for HVAC Equipment
23 0514	Variable Frequency Drives
23 0515	Controllers, Starters, and Electrical Work
23 0517	Sleeves, Seals, and Escutscheons
23 0519	Meters and Gauges for HVAC Piping
23 0523.01	General Duty Valves for HVAC Piping
23 0523.03	Gas Valves for HVAC Systems
23 0529	Hangers and Supports for HVAC Piping
23 0533	Heat Tracing for HVAC Piping
23 0548	Sound, Vibration, and Seismic Control for HVAC
23 0553	Identification for HVAC Piping and Equipment
23 0592	System Start-Up
23 0593	Testing, Adjusting, and Balancing for HVAC
23 0601	Hydronic Specialties
23 0603	HVAC Water Treatment
23 0700	HVAC Insulation
23 0713	Duct Insulation
23 0719	HVAC Piping Insulation
23 0900	Instrumentation and Controls for HVAC (General)
23 0900.1	Controls for HVAC (Dampers and Valves)
23 0900.2	Controls for HVAC (Flow Measurement)
23 0904	Building Automation System
23 0905	Smoke Devices and Systems
23 0993	Sequence of Operations HVAC Controls & Points List

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DIVISION NUMBER	DIVISION AND SECTION TITLES
23 0993.1	Sequence of Operation Central Air Handling Equipment
23 0993.2	Sequence of Operation Air Handling Equipment
23 0993.3	Sequence of Operation Hydronic Systems
23 0993.4	Sequence of Operation Electric Heaters
23 0993.9	Sequence of Operation Various Systems
23 2113	HVAC Piping (General)
23 2113.1	Preinsulated Underground Piping
23 2123	Hydronic Pumps
23 3112	Mechanical Duct
23 3113.1	Metal Duct
23 3113.3	Fiberglass Reinforced Plastic Duct Below Grade
23 3300	Duct Accessories
23 3313	Dampers
23 3346	Flexible Duct
23 3400	HVAC Fans
23 3600	Air Terminal Units
23 3713	Diffusers, Registers, and Grilles
23 4100	Particulate Air Filtration
23 5216.1	Condensing Boilers
23 6426	Water Chillers (Air Cooled)
23 9001	Heat Transfer (Hydronic)
23 9005.2	Heat Transfer (Electric Cooling, VRF Systems)
23 9006	Heat Transfer (Electric Heaters)
23 9007	Modular Air Handler
23 9010	Heat Transfer (Refrigerant Specialties)

Specification Index

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26	Electrical	
	26 0500	Electrical General Requirements
	26 0501	Electrical Coordination
	26 0503	Cutting, Patching and Repair
	26 0519	Wire and Cable - Building Wire (600 Volts and Below)
	26 0526	Grounding
	26 0533	Metallic Conduits/Raceways and Fittings
	26 0534	Rigid Non-Metallic (PVC) Conduits/Raceways and Fittings
	26 0535	Electrical Boxes
	26 0548	Vibration and Seismic Controls for Electrical Systems
	26 0923	Automatic Lighting Control
	26 0961	Performance Lighting Power and Controls Devices Installation
	26 0961.40	Performance Machinery Devices Installation
	26 2200	Dry Type Transformers
	26 2413	Switchboards
	26 2416	Panelboards
	26 2726	Wiring Devices
	26 2816	Safety/Disconnect Switches
	26 3213	Engine Generators
	26 4313	Surge Protective Devices
	26 5100	Lighting
27	Communications	
	27 0500	Empty Conduit for Technology & Communication Systems
	27 4100	Audio/Video Systems
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	28 3111	Fire Alarm System – Voice System
	28 3133	Fire Alarm Performance Equipment Interface
31	Earthwork	
	0313116	Termite Control
32	Exterior Improvements	
	321313	Concrete Paving
	321373	Concrete Paving Joint Sealants
	321413.13	Precast Concrete Unit Pavers and Base
	329113	Soil Preparation
	329200	Turf and Grasses

Specification Index

DIVISION NUMBER	DIVISION AND SECTION TITLES	
33	Utilities	
	334600	Subdrainage
34	Transportation	
	Not Used	
35	Waterway and Marine	
	Not Used	
40	Process Integration	
	Not Used	
41	Material Processing and Handling Equipment	
	Not Used	
42	Process Heating, Cooling and Drying Equipment	
	Not Used	
43	Process Gas and Liquid Handling, Purification and Storage Equipment	
	Not Used	
44	Pollution Control Equipment	
	Not Used	
45	Industry-Specific Manufacturing Equipment	
	Not Used	
48	Electrical Power Generation	
	Not Used	

PROPOSED SUBSTITUTION REQUEST FORM
Form must be signed by a General Contractor bidding the work.

To: _____
(General Contractor's name)

We hereby submit for your consideration the following product in lieu of the specified item for the above project:

DRAWING NO.	SPECIFICATION SECTION	PARAGRAPH	ITEM SPECIFIED
_____	_____	_____	_____

Proposed Substitution: _____

Manufacturer: _____

Attach complete information on proposed changes and/or to Drawings and/or Specifications which the proposed substitution will require for its proper installation.

Provide the length of time the manufacturer has been in business in the manufacturer of this product.

Submit with request all necessary samples, manufacturer's substantiating data, performance and test reports to prove equal quality and performance to the product that is specified. Clearly mark manufacturer's literature to indicate equality in performance to assist in the evaluation of the substitution by the Architect. Provide a written description of the proposed substitution and provide as an attachment to this request form.

The following supporting data is attached to this substitution:

- Drawings Performance & Test Reports Written Description
 Product Samples Samples Other

Complete the following:

1. Does the proposed substitution affect dimensions and or details shown on the Drawings? Yes No
If yes, clearly indicate the changes below or on an attached sheet.

2. Will the undersigned pay for any and all changes to the building design, including engineering and detailing costs caused by the requested substitution? Yes No
If no, fully explain:

3. Does the proposed substitution have any affect on other Contracts or other Trades? Yes No
If yes, fully explain: _____

4. Does the proposed substitution affect the construction schedule? Yes No
If yes, fully explain: _____

5. The differences between the warranties of the proposed substitution and specified items are:

Same _____ Different _____ (Explain on attachment.)

6. State the reason for the proposed substitution request: _____

PROPOSED SUBSTITUTION REQUEST FORM
Form must be signed by a General Contractor bidding the work.

-
7. Itemize the comparison of specified item(s) with the proposed substitution; list all variations: _____
-
8. Provide cost comparison between the proposed substitution and the product specified. _____
-
9. Provide a detail explanation as to why this substitution is a benefit to the Owner. _____
-
10. Will service and maintenance parts be readily available after installation is complete? _____
-
11. If it is determined that this proposed substitution does not comply with the contract documents after approval, will the undersigned agree to pay for the removal and reinstallation of one of the specified products.
 Yes
 No If no, explain : _____
-
12. Years the manufacturer been in business producing this product? _____

The undersigned certifies that the proposed substitution has been fully investigated and the function, appearance and quality are equivalent or superior to the specified item. **Form must be signed by a General Contractor bidding the work.**

The person signing this substitution request form shall have authority to legally bind his firm to the terms listed above. The failure to provide a legally binding signature will result in the Architect's rejection of this proposed substitution.

Submitted By:

Name (Signature)

Name (Printed)

Title

Firm

Address

Telephone

Date

Email Address:

Architect's Response:

If the proposed substitution is approved by the Architect during the bidding phase the proposed product will be listed in an addendum stating the product is approved.

Approval of the substitution in an addendum does not relieve the Contractor's of his responsibility for meeting the requirements of the contract documents and the information provided and certified on this Proposed Substitution Request Form.

Should this form be used to make a substitution request after the bidding phase, the approval of a substitution will be documented by Change Order.

Craig Gauden Davis
19 Washington Park
Greenville, SC 29601
(864) 242-0761

SECTION 057313 - GLAZED DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Glass-supported railings.
 - 2. Point-supported structural glass rail system.

1.3 DEFINITIONS

- A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas and for pedestrian guidance and support, visual separation, or wall protection.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
 - 1. Steel: 72 percent of minimum yield strength.
 - 2. Stainless Steel: 60 percent of minimum yield strength.
- C. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to SEI/ASCE 7:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
 - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
 - b. Uniform load of 25 lbf/sq. ft. applied horizontally.
 - c. Infill load and other loads need not be assumed to act concurrently.

1.5 COORDINATION AND SCHEDULING

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

1.6 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.7 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of railings assembled from standard components.
 - 2. Grout, anchoring cement, and paint products.
 - 3. Railing brackets.
- B. Shop Drawings: Include plans, elevations, sections, and attachment details.
- C. Samples for Verification: For each type of exposed finish required.
 - 1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
 - 2. Each type of glass required.
 - 3. Fittings and brackets.
 - 4. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height.
- D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Welding certificates.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

1.9 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
- C. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.10 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Livers "Button Rail", "C. R. Laurence SRS Standoff" or comparable product by one of the following:
 - 1. C. R. Laurence Co., Inc. Product: SRS Standoff
 - 2. Livers Bronze Co. Product: Button Rail.
- B. Source Limitations: Obtain each type of railing from single source from single manufacturer.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods, including structural analysis, preconstruction testing, field testing, and in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of railings and are based on the specific system indicated. See Section 016000 "Product Requirements."
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.3 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.
- B. Extruded Bars and Shapes: ASTM B 221, Alloy 6063-T5/T52.

2.4 STAINLESS STEEL

- A. Tubing: ASTM A 554, Grade MT 304.
- B. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.
- C. Sheet, Strip, Plate, and Flat Bar: ASTM A 666 or ASTM A 240/A 240M, Type 304.
- D. Bars and Shapes: ASTM A 276, Type 304.

2.5 STEEL AND IRON

- A. Bars: Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.

2.6 GLASS AND GLAZING MATERIALS

- A. Tempered Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type 1 (transparent flat glass), Quality-Q3. Provide products that have been tested for surface and edge compression according to ASTM C 1048 and for impact strength according to 16 CFR 1201 for Category II materials.
 - 1. Glass Color: Clear, Low-Iron.
 - 2. Glass finish: Frosted both sides.
 - 3. Thickness for Structural Glass Balusters: As required by structural loads, but not less than 19.0 mm.
- B. Glazing Gaskets for Glass Infill Panels: Glazing gaskets and related accessories recommended or supplied by railing manufacturer for installing glass infill panels in post-supported railings.

2.7 FASTENERS

- A. Fastener Materials: Unless otherwise indicated, provide the following:
 - 1. Stainless-Steel Components: Type 304 stainless-steel fasteners.
 - 2. Dissimilar Metals: Type 304 stainless-steel fasteners.
- B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless exposed fasteners are the standard fastening method for railings indicated.
 - 1. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

2.8 MISCELLANEOUS MATERIALS

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

2.9 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- H. Form changes in direction as follows:
 - 1. By flush bends or by inserting prefabricated flush-elbow fittings.
- I. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- J. Close exposed ends of hollow railing members with prefabricated end fittings.
- K. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work where indicated.
 - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and to prevent bracket or fitting rotation and crushing of substrate.
- L. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- M. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

2.10 GLAZING PANEL FABRICATION

- A. General: Fabricate to sizes and shapes required; provide for proper edge clearance and bite on glazing panels.

1. Clean-cut or flat-grind edges at butt-glazed sealant joints to produce square edges with slight chamfers at junctions of edges and faces.
2. Grind smooth exposed edges, including those at open joints, to produce square edges with slight chamfers at junctions of edges and faces.

B. Structural Balusters: Provide tempered glass panels.

2.11 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.12 STAINLESS-STEEL FINISHES

- A. Satin, Reflective, Directional Polish: No. 7.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 1. Coat concealed surfaces of copper alloys that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

3.3 INSTALLING GLASS PANELS

- A. Glass-Supported Railings: Install assembly to comply with railing manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and to prepare test reports. Payment for these services will be made by Owner.

3.5 CLEANING

- A. Clean stainless steel by washing thoroughly with water and soap, rinsing with clean water, and wiping dry.
- B. Clean copper alloys according to metal finisher's written instructions in a manner that leaves an undamaged and uniform finish matching approved Sample.
- C. Clean and polish glass as recommended in writing by manufacturer. Wash both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion.

3.6 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 057313

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wall sheathing.
 - 2. Subflooring for wood stage floor.
 - 3. Hardboard for stage floor.
 - 4. Sheathing joint and penetration treatment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
 - 2. Include copies of EIFS manufacturer's acceptance for use as substrate for EIFS application under Section 072419-Water Drainage Exterior Insulation and Finish System.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

2.2 WALL SHEATHING

A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. G-P Gypsum Corporation; Dens-Glass Gold.
 - b. National Gypsum Company; Gold Bond e(2)XP.
 - c. United States Gypsum Co.; Securock.
2. Type and Thickness: Regular, 1/2 inch thick.
3. Size: 48 by 96 inches, 48 by 108 inches, or 48 by 120 inches for vertical installation.

2.3 SUBFLOORING AND UNDERLAYMENT

A. Plywood Subflooring: Exposure 1 single-floor panels or sheathing.

1. Nominal Thickness: Not less than 23/32 inch.

B. Hardboard Underlayment (Stage Flooring): ANSI A135.4 Class 1 Tempered, Surface S2S.

1. Service class indicated with red stripes on edges.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

B. Power-Driven Fasteners: NES NER-272.

C. Wood Screws: ASME B18.6.1.

D. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

1. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C 954.

2.5 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
- D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 [WOOD]CBPB STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Subflooring:
 - a. Screw to wood sleepers.
 - b. Follow manufacturer's written installation instructions.
 - c. Space panels 1/8 inch apart at edges and ends.

3.3 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 2. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 3. Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each steel stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
- D. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.
1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
- E. Seal sheathing joints according to sheathing manufacturer's written instructions.
1. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.4 HARDBOARD INSTALLATION

- A. Comply with CPA's recommendations and hardboard manufacturer's written instructions for preparing and applying hardboard underlayment.
1. Fastening Method: Screw hardboard to subfloor.

END OF SECTION 061600

SECTION 071113 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Cold-applied, emulsified-asphalt dampproofing.
- B. Related Requirements:
 - 1. Section 071326 "Self-Adhering Sheet Waterproofing" for waterproofing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 FIELD CONDITIONS

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.
- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide protection course and auxiliary materials recommended in writing by manufacturer of primary materials.

2.2 PERFORMANCE REQUIREMENTS

- A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless otherwise indicated.

2.3 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings Henry "HE787 Elastomulsion" or comparable product by one of the following:
 - 1. BASF Corporation-Construction Systems.
 - 2. Euclid Chemical Company (The); an RPM company.
 - 3. Henry Company.
 - 4. Karnak Corporation.
 - 5. W.R. Meadows, Inc.
- C. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

2.4 AUXILIARY MATERIALS

- A. Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.
- B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
- C. Protection Course: Extruded-polystyrene board insulation, unfaced, ASTM C 578, Type X, 1/2 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for surface smoothness, maximum surface moisture content, and other conditions affecting performance of the Work.
- B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for dampproofing application.
- B. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.

- C. Clean substrates of projections and substances detrimental to dampproofing work; fill voids, seal joints, and remove bond breakers if any.

3.3 APPLICATION, GENERAL

- A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless otherwise indicated.
 - 1. Apply dampproofing to provide continuous plane of protection.
 - 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.
 - 1. Extend dampproofing 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
- C. Where dampproofing exterior face of inner wythe of exterior masonry cavity walls, lap dampproofing at least 1/4 inch onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.

3.4 COLD-APPLIED, CUT-BACK-ASPHALT DAMPPROOFING

- A. Concrete Foundations: Apply two brush or spray coats at not less than 1.25 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat.
- B. Concrete Backup for Brick Veneer Assemblies: Apply one brush or spray coat at not less than 1 gal./100 sq. ft..

3.5 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Unexposed Face of Concrete or Masonry Retaining Walls: Apply primer and one brush or spray coat at not less than 1.25 gal./100 sq. ft..
 - 1. Apply to soil side of interior walls retaining soil above floor level.
 - a. Apply dampproofing to wall and footing.
 - b. Backfill with suitable soil or stone.
 - c. Tie under-slab vapor barrier membrane to dampproofing.
 - d. Place concrete for elevated slab on grade.

3.6 PROTECTION COURSE INSTALLATION

- A. Install protection course over completed-and-cured dampproofing. Comply with dampproofing-material and protection-course manufacturers' written instructions for attaching protection course.
 - 1. Apply protection course at backfill locations.
 - 2. Support protection course over cured coating with spot application of adhesive type recommended in writing by protection-board manufacturer.

3.7 PROTECTION

- A. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where panels are subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- B. Correct dampproofing that does not comply with requirements; repair substrates, and reapply dampproofing.

END OF SECTION 071113

SECTION 072419 - WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
 - 1. Water-drainage exterior insulation and finish system (EIFS), Class PB, applied over water-resistive coating over sheathing.
- B. Related Sections:
 - 1. Division 06 Section "Sheathing" for sheathing.

1.3 SYSTEM DESCRIPTION

- A. Water-Drainage EIFS: EIFS with a means that allows water entering into an EIFS assembly to drain to the exterior.

1.4 PERFORMANCE REQUIREMENTS

- A. EIFS Performance: Comply with the following:
 - 1. Bond Integrity: Free from bond failure within EIFS components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.
 - 2. Weathertightness: Resistant to water penetration from exterior into water-drainage EIFS and assemblies behind it or through them into interior of building that results in deterioration of thermal-insulating effectiveness or other degradation of EIFS and assemblies behind it, including substrates, supporting wall construction, and interior finish, and including a means that allows water entering into an EIFS assembly to drain to the exterior.
- B. Class PB EIFS: Provide EIFS having physical properties and structural performance that comply with the following:
 - 1. Abrasion Resistance: Sample consisting of 1-inch- thick EIFS mounted on 1/2-inch- thick gypsum board; cured for a minimum of 28 days; and showing no cracking, checking, or loss of film integrity after exposure to 528 quarts of sand when tested per ASTM D 968, Method A.
 - 2. Absorption-Freeze Resistance: No visible deleterious effects and negligible weight loss after 60 cycles per EIMA 101.01.

3. Accelerated Weathering: Five samples per ICC-ES AC235 showing no cracking, checking, crazing, erosion, rusting, blistering, peeling, delamination, or other characteristics that might affect performance as a wall cladding after testing for 2000 hours when viewed under 5 times magnification per ASTM G 153 or ASTM G 154.
4. Freeze-Thaw: No surface changes, cracking, checking, crazing, erosion, rusting, blistering, peeling, or delamination, or indications of delamination between components when viewed under 5 times magnification after 60 cycles per EIMA 101.01.
5. Mildew Resistance of Finish Coat: Sample applied to 2-by-2-inch clean glass substrate, cured for 28 days, and showing no growth when tested per ASTM D 3273 and evaluated according to ASTM D 3274.
6. Salt-Spray Resistance: No deleterious affects when tested according to ICC-ES AC235.
7. Tensile Adhesion: No failure in the EIFS, adhesive, base coat, or finish coat when tested per EIMA 101.03.
8. Water Penetration: Sample consisting of 1-inch- thick EIFS mounted on 1/2-inch- thick gypsum board, cured for 28 days, and showing no water penetration into the plane of the base coat to expanded polystyrene board interface of the test specimen after 15 minutes at 6.24 lbf/sq. ft. of air pressure difference or 20 percent of positive design wind pressure, whichever is greater, across the specimen during a test period when tested per EIMA 101.02.
9. Water Resistance: Three samples, each consisting of 1-inch- thick EIFS mounted on 1/2-inch- thick gypsum board; cured for 28 days; and showing no cracking, checking, crazing, erosion, rusting, blistering, peeling, or delamination after testing for 14 days per ASTM D 2247.
10. Impact Resistance: Sample consisting of 1-inch- thick EIFS when constructed, conditioned, and tested per EIMA 101.86; and meeting or exceeding the following:
 - a. Standard Impact Resistance: 25 to 49 inch-lb.
11. Drainage: According to ICC-ES AC235.
12. Structural Performance Testing: EIFS assembly and components shall comply with ICC-ES AC235 when tested per ASTM E 330.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type and component of EIFS indicated.
- B. Shop Drawings: For EIFS. Include plans, elevations, sections, details of components, details of penetration and termination, flashing details, joint locations and configurations, fastening and anchorage details including mechanical fasteners, and connections and attachments to other work.
- C. Samples for Verification: 24-inch- square panels for each type of finish-coat color and texture indicated, prepared using same tools and techniques intended for actual work including a typical control joint filled with sealant of color selected.
 1. Include sealant samples to verify color selected.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Manufacturer Certificates: Signed by manufacturers certifying that EIFS comply with requirements.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each water-/weather-resistive barrier, insulation, reinforcing mesh, joint sealant, and coating.

- D. Compatibility and Adhesion Test Reports: For joint sealants from sealant manufacturer indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

 - E. Evaluation Reports: For fasteners water-resistive coating adhesive membrane flashing and EIFS (including insulation), from ICC-ES.
- 1.7 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For EIFS to include in maintenance manuals.
- 1.8 QUALITY ASSURANCE
- A. Installer Qualifications: An installer who is certified in writing by EIFS manufacturer as qualified to install manufacturer's system using trained workers.
 - 1. A qualified contractor shall have a minimum of five (5) years proven satisfactory experience and successful completion of projects of similar scope and shall show proof before commencement of work that he will maintain a qualified crew throughout the duration of the work. When requested, Contractor shall provide a list of the last three comparable jobs including, name and location, specifying authority / project manager, start / completion dates and value of the EIFS work.

 - B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.

 - C. Fire-Test-Response Characteristics: Provide EIFS and system components with the following fire-test-response characteristics as determined by testing identical EIFS and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E 119.
 - 2. Intermediate-Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which EIFS is a part, complies with NFPA 285 for test method and required fire-test-response characteristics of exterior non-load-bearing wall panel assemblies containing foam-plastic insulation.
 - 3. Radiant Heat Exposure: No ignition of EIFS when tested according to NFPA 268.
 - 4. Potential Heat: Acceptable level when tested according to NFPA 259.
 - 5. Surface-Burning Characteristics: Provide insulation board, adhesives, base coats, and finish coats with flame-spread index of 25 or less and smoke-developed index of 450 or less, per ASTM E 84.

 - D. Preinstallation Conference: Conduct conference at Project site.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.

- B. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.
 - 1. Stack insulation board flat and off the ground.
 - 2. Protect plastic insulation against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.10 PROJECT CONDITIONS

- A. Weather Limitations: Maintain ambient temperatures above 40 deg F for a minimum of 24 hours before, during, and after adhesives or coatings are applied. Do not apply EIFS adhesives or coatings during rainfall. Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.

1.11 COORDINATION

- A. Coordinate installation of EIFS with related Work specified in other Sections to ensure that wall assemblies, including sheathing, weather-resistant sheathing paper, flashing, trim, joint sealants, windows, and doors, are protected against damage from the effects of weather, age, corrosion, moisture, and other causes. Do not allow water to penetrate behind flashing and drainage plane that is behind water-drainage EIFS.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Dryvit Systems, Inc.: Product "Outsulation MD". (Basis-of-Design)
 - 2. Senergy; Degussa Wall Systems, Inc.
 - 3. Sto Corp.

2.2 MATERIALS

- A. Compatibility: Provide water-resistive coating, adhesive, fasteners, board insulation, reinforcing meshes, base- and finish-coat systems, sealants, and accessories that are compatible with one another and with substrates and approved for use by EIFS manufacturer for Project.
- B. Water-Resistive Coatings: EIFS manufacturer's standard formulation and accessories for use as water/weather-resistive barriers, compatible with substrate, and complying with physical and performance criteria of ICC-ES AC209.
 - 1. Sheathing Joint Compound and Tape: Type recommended by EIFS manufacturer for sealing joints between and penetrations through sheathing.

- C. Primer/Sealer: EIFS manufacturer's standard substrate conditioner designed to seal substrates from moisture penetration and to improve the bond between substrate of type indicated and adhesive used for application of insulation.
- D. Flexible-Membrane Flashing: Cold-applied, fully self-adhering, self-healing, rubberized-asphalt and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.
- E. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; compatible with substrate; with VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24); and complying with[one of] the following:
- F. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with ASTM C 578, Type I; EIFS manufacturer's requirements; and EIMA's "EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board" for most stringent requirements for material performance and qualities of insulation, including dimensions and permissible variations, and the following:
 - 1. Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, per ASTM E 84.
 - 2. Dimensions: Provide insulation boards not more than 24 by 48 inches and in thickness indicated but not more than 4 inches thick or less than thickness allowed by ASTM C 1397.
 - 3. Channeled Board Insulation: EIFS manufacturer's standard factory-fabricated profile with linear, vertical drainage channels, slots, or waves on the back side of board.
 - 4. Foam Shapes: Provide with profiles and dimensions indicated on Drawings.
- G. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multiend strands with retained mesh tensile strength of not less than 120 lbf/in. per ASTM E 2098; complying with ASTM D 578 and the following:
 - 1. Standard-Impact Reinforcing Mesh: Not less than 4.0 oz./sq. yd..
 - 2. Intermediate-Impact Reinforcing Mesh: Not less than 10 oz./sq. yd. .
 - 3. Strip Reinforcing Mesh: Not less than 3.75 oz./sq. yd..
 - 4. Detail Reinforcing Mesh: Not less than 4.0 oz./sq. yd..
 - 5. Corner Reinforcing Mesh: Not less than 7.2 oz./sq. yd..
- H. Base-Coat Materials: EIFS manufacturer's standard mixture complying with one of the following requirements:
 - 1. Factory-blended dry formulation of portland cement, dry polymer admixture, and inert fillers to which only water is added at Project site.
- I. Finish-Coat Materials: EIFS manufacturer's standard acrylic-based coating complying with the following:
 - 1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.
 - 2. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, and fillers used with stone particles for embedding in finish coat to produce an applied-aggregate finish.
 - a. Aggregate: Marble chips of size and color to match Architect's samples.
 - 3. Colors: As selected by Architect from manufacturer's full range.
 - a. EIFS 1: Sandblast finish - from manufacturer's standard color range.
 - b. EIFS 2: Ameristone Finish - from manufacturer's standard color range.

- J. Water: Potable.
- K. Mechanical Fasteners: EIFS manufacturer's standard corrosion-resistant fasteners consisting of thermal cap, standard washer and shaft attachments, and fastener indicated below; selected for properties of pullout, tensile, and shear strength required to resist design loads of application indicated; capable of pulling fastener head below surface of insulation board; and of the following description:
 - 1. For attachment to steel studs from 0.033 to 0.112 inch in thickness, provide steel drill screws complying with ASTM C 954.
 - 2. For attachment to light-gage steel framing members not less than 0.0179 inch in thickness, provide steel drill screws complying with ASTM C 1002.
- L. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with EIFS manufacturer's written instructions; manufactured from UV-stabilized PVC; and complying with ASTM D 1784, manufacturer's standard Cell Class for use intended, and ASTM C 1063.
 - 1. Casing Bead: Prefabricated, one-piece type for attachment behind insulation, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.
 - 2. Drip Screed/Track: Prefabricated, one-piece type for attachment behind insulation with face leg extended to form a drip, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.
 - 3. Weep Screed/Track: Prefabricated, one-piece type for attachment behind insulation with perforated face leg extended to form a drip and weep holes in track bottom, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg; designed to drain incidental moisture that gets into wall construction to the exterior at terminations of EIFS with drainage.
 - 4. Expansion Joint: Prefabricated, one-piece V profile; designed to relieve stress of movement.
 - 5. Window Sill Flashing: Prefabricated type for both flashing and sloping sill over framing beneath windows; with end and back dams; designed to direct water to exterior.

2.3 ELASTOMERIC SEALANTS

- A. Elastomeric Sealant Products: Provide EIFS manufacturer's listed and recommended chemically curing, elastomeric sealant that is compatible with joint fillers, joint substrates, and other related materials, and complies with requirements for products and testing indicated in ASTM C 1481 and with requirements in Division 07 Section "Joint Sealants" for products corresponding to description indicated below:
 - 1. Single-component, nonsag, neutral-curing silicone sealant.

2.4 MIXING

- A. General: Comply with EIFS manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as recommended by EIFS manufacturer. Mix materials in clean containers. Use materials within time period specified by EIFS manufacturer or discard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of EIFS.
- B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Begin coating application only after surfaces are dry.
 - 2. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind drainage plane of EIFS and deterioration of substrates.
- C. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.

3.3 EIFS INSTALLATION, GENERAL

- A. Comply with EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.

3.4 SUBSTRATE PROTECTION APPLICATION

- A. Primer/Sealer: Apply over gypsum sheathing substrates to protect substrates from degradation and where required by EIFS manufacturer for improving adhesion of insulation to substrate.
- B. Water-Resistive Coatings: Apply over substrates to protect substrates from degradation and to provide water-/weather-resistive barrier.
 - 1. Tape and seal joints, exposed edges, terminations, and inside and outside corners of sheathing unless otherwise indicated by EIFS manufacturer's written instructions.

3.5 TRIM INSTALLATION

- A. Trim: Apply trim accessories at perimeter of EIFS, at expansion joints, and elsewhere as indicated, according to EIFS manufacturer's written instructions. Coordinate with installation of insulation.
 - 1. Weep Screenshot/Track: Use at bottom termination edges, at window and door heads, and at floor line expansion joints of water-drainage EIFS unless otherwise indicated.

2. Expansion Joint: Use where indicated on Drawings.
3. Casing Bead: Use at other locations.

3.6 INSULATION INSTALLATION

A. Board Insulation: Adhesively and mechanically attach insulation to substrate in compliance with ASTM C 1397, EIFS manufacturer's written instructions, and the following:

1. Apply adhesive to ridges on back of insulation by notched-trowel method in a manner that results in full adhesive contact over the entire surface of ridges, leaving channels free of adhesive once insulation is adhered to substrate.
2. Press and slide insulation into place. Apply pressure over the entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.
3. Allow adhered insulation to remain undisturbed for period recommended by EIFS manufacturer, but not less than 24 hours, before beginning rasping and sanding insulation, or applying base coat and reinforcing mesh.
4. Begin first course of insulation from a level base line and work upward.
5. Begin first course of insulation from screed/track and work upward. Work from perimeter casing beads toward interior of panels if possible.
6. Stagger vertical joints of insulation boards in successive courses to produce running bond pattern. Locate joints so no piece of insulation is less than 12 inches wide or 6 inches high. Offset joints not less than 6 inches from corners of window and door openings and not less than 4 inches from aesthetic reveals.
 - a. Adhesive Attachment: Offset joints of insulation not less than 6 inches from horizontal and 4 inches from vertical joints in sheathing.
7. Place insulation with adhesive strips and channels, slots, or waves aligned in the vertical position for drainage. Align drainage channels, slots, or waves with channels, slots, or waves in insulation boards above and below.
8. Interlock ends at internal and external corners.
9. Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.
10. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
11. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/16 inch from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch.
12. Cut aesthetic reveals in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that comply with profiles and locations indicated. Do not reduce insulation thickness at aesthetic reveals to less than 3/4 inch.
13. Install foam shapes and attach to sheathing.
14. Interrupt insulation for expansion joints where indicated.
15. Form joints for sealant application with back-to-back casing beads for joints within EIFS and with perimeter casing beads at dissimilar adjoining surfaces. Make gaps between casing beads and between perimeter casing beads and adjoining surfaces of width indicated.
16. After installing insulation and before applying field-applied reinforcing mesh, fully wrap board edges. Cover edges of board and extend encapsulating mesh not less than 2-1/2 inches over front and back face unless otherwise indicated on Drawings.
17. Treat exposed edges of insulation as follows:
 - a. Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.
 - b. Encapsulate edges forming substrates of sealant joints within EIFS or between EIFS and other work with base coat and reinforcing mesh.

- c. At edges trimmed by accessories, extend base coat, reinforcing mesh, and finish coat over face leg of accessories.
18. Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and water-/weather-resistive barrier.
- B. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, and as follows:
 1. At expansion joints in substrates behind EIFS.
 2. Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.
 3. Where wall height or building shape changes.
 4. Where EIFS manufacturer requires joints in long continuous elevations.

3.7 BASE-COAT INSTALLATION

- A. Base Coat: Apply to exposed surfaces of insulation in minimum thickness recommended in writing by EIFS manufacturer, but not less than 1/16-inch dry-coat thickness.
- B. Reinforcing Mesh: Embed type indicated below in wet base coat to produce wrinkle-free installation with mesh continuous at corners and overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C 1397 and EIFS manufacturer's written instructions. Do not lap reinforcing mesh within 8 inches of corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.
 1. Intermediate-impact reinforcing mesh where indicated and at outside corners and openings to 15'-0" above finished grade. .
- C. intermediate-impact reinforcing mesh where indicatedAdditional Reinforcing Mesh: Apply strip reinforcing mesh around openings extending 4 inches beyond perimeter. Apply additional 9-by-12-inch strip reinforcing mesh diagonally at corners of openings (re-entrant corners). Apply 8-inch- wide strip reinforcing mesh at both inside and outside corners unless base layer of mesh is lapped not less than 4 inches on each side of corners.
 1. At aesthetic reveals, apply strip reinforcing mesh not less than 8 inches wide.
 2. Embed strip reinforcing mesh in base coat before applying first layer of reinforcing mesh.
 3. As required to obtain impact resistance required by this section.
- D. Double Base-Coat Application: Apply second base coat in same manner and thickness as first application except without reinforcing mesh. Do not apply until first base coat has cured.

3.8 FINISH-COAT INSTALLATION

- A. Finish Coat: Apply over dry base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by EIFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
 1. Texture: As indicated by manufacturer's designations.
- B. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by EIFS manufacturer.

3.9 INSTALLATION OF JOINT SEALANTS

- A. Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements in Division 07 Section "Joint Sealants" and in ASTM C 1481.
 - 1. Apply joint sealants after base coat has cured but before applying finish coat.
 - 2. Clean surfaces to receive sealants to comply with indicated requirements and EIFS manufacturer's written instructions.
 - 3. Apply primer recommended in writing by sealant manufacturer for surfaces to be sealed.
 - 4. Install sealant backing to control depth and configuration of sealant joint and to prevent sealant from adhering to back of joint.
 - 5. Apply masking tape to protect areas adjacent to sealant joints. Remove tape immediately after tooling joints, without disturbing joint seal.
 - 6. Recess sealant sufficiently from surface of EIFS so an additional sealant application, including cylindrical sealant backing, can be installed without protruding beyond EIFS surface.

3.10 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. According to ICC-ES AC235.
 - 2. Test and inspect as required by IBC, Subsection 1705.15.1
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. EIFS Tests and Inspections: For the following:
 - 1. According to ICC-ES AC235.
- D. Remove and replace EIFS where test results indicate that EIFS do not comply with specified requirements.
- E. Prepare test and inspection reports.

3.11 CLEANING AND PROTECTION

- A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.

END OF SECTION 072419

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Vapor-permeable, fluid-applied air barriers.
- B. Related Requirements:
 - 1. Section 061600 "Sheathing" for wall sheathings and wall sheathing joint-and-penetration treatments.
 - 2. Section 072419 "Exterior Insulation and Finish System (EIFS)" for air barriers installed as the weather barrier as part of EIFS system.

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.

1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.
2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1. A qualified contractor shall have a track record of at least 5 years of managing work of similar nature and the successful installations of similar scope.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.

2.3 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

- A. High-Build, Vapor-Permeable Air Barrier: membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.
1. Synthetic Polymer Type:
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) Grace Construction Products; W.R. Grace & Co. -- Conn.; Perm-A-Barrier VP.
 - 2) Henry Company, Sealants Division; Air-Bloc 31MR (Basis-of-Design Product).
 - 3) Tremco Incorporated; ExoAir 230.
 2. Physical and Performance Properties:
 - a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
 - b. Vapor Permeance: Minimum 10 perms; ASTM E 96/E 96M, Desiccant Method, Procedure A.
 - c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
 - d. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D 4541.
 - e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
 - f. UV Resistance: Can be exposed to sunlight for 90 days according to manufacturer's written instructions.

2.4 ACCESSORY MATERIALS

- A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.
- D. Preformed Silicone Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Coordinate with building envelope areas not protected by EIFS weather barrier system. Provide for a complete enclosure of the building envelope, including accessories and transitions for a complete system without gaps in enclosure.

- B. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 - 2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
 - 3. Verify that substrates are visibly dry and free of moisture. Test concrete substrates for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 4. Verify that masonry joints are flush and completely filled with mortar.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.
- H. Bridge isolation joints expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
 - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
 - 1. Transition Strip: Roll firmly to enhance adhesion.
- F. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- G. Seal top of through-wall flashings to air barrier with an additional 6-inch- wide, transition strip.
- H. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- I. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
- B. Medium-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply an increased thickness of air-barrier material in full contact around protrusions such as masonry ties.
 - 1. Vapor-Retarding, Medium-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, applied in one or more equal coats. Apply additional material as needed to achieve void- and pinhole-free surface.
- C. Do not cover air barrier until it has been tested and inspected by testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Air-barrier dry film thickness.
 - 3. Continuous structural support of air-barrier system has been provided.
 - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 5. Site conditions for application temperature and dryness of substrates have been maintained.
 - 6. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 7. Surfaces have been primed, if applicable.
 - 8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 - 9. Termination mastic has been applied on cut edges.
 - 10. Strips and transition strips have been firmly adhered to substrate.
 - 11. Compatible materials have been used.
 - 12. Transitions at changes in direction and structural support at gaps have been provided.
 - 13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 - 14. All penetrations have been sealed.
- D. Tests: As determined by testing agency from among the following tests:
 - 1. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.
- E. Air barriers will be considered defective if they do not pass tests and inspections.
 - 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
 - 2. Remove and replace deficient air-barrier components for retesting as specified above.
- F. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- G. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 - 1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.

2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 072726

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Copings.
 - 2. Roof-edge flashings.
 - 3. Roof-edge drainage systems.
 - 4. Reglets and counterflashings.
 - 5. Gutters and Downspouts.
- B. Related Sections:
 - 1. Division 07 Section "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.

1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashing tested according to SPRI ES-1 and capable of resisting the following design pressures:

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work. Include the following:
 - 1. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
 - 2. Pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 - 3. Details of termination points and assemblies, including fixed points.
- C. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.
- D. Samples for Verification: For copings roof-edge drainage systems made from 12-inch lengths of full-size components including fasteners, cover joints, accessories, and attachments.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for copings.
- B. Warranty: Sample of special warranty.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects roof specialties including installers of roofing materials and accessories.
 - 2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

1.8 WARRANTY

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

PART 2 - PRODUCTS

2.1 EXPOSED METALS

- A. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
 - 1. Surface: Smooth, flat finish.
 - 2. Exposed Coil-Coated Finishes: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer: AAMA 620. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
- B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:

ROOF SPECIALTIES

1. Exposed High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer: AAMA 2605. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.

C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.2 CONCEALED METALS

- A. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and structural performance indicated, mill finished.
- B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
- B. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

2.5 COPINGS

- A. Copings: Manufactured coping system consisting of formed-metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; corner units, end cap units, and concealed splice plates with same finish as coping caps.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Hickman Company, W. P. "Permasnap Plus" (Basis-of-Design).
 - b. Johns Manville.
 - c. Metal-Era, Inc.
 - d. Metal-Fab Manufacturing, LLC.
 - e. MM Systems Corporation.
 - f. National Sheet Metal Systems, Inc.
 2. Coping-Cap Material: Formed aluminum, 0.063 inch thick thickness as required to meet performance requirements.
 - a. Finish: Three-coat fluoropolymer.

- b. Color: As selected by Architect from manufacturer's full range.
3. Corners and End Caps: Factory mitered and mechanically clinched and sealed watertight.
4. Coping-Cap Attachment Method: Snap-on, face and back legs hooked to cleat. Face leg hooked to continuous cleat, fabricated from coping-cap material.
5. Snap-on-Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.
6. Joints: Minimum 6" wide concealed splice plate from .050" aluminum finished to match coping cap. Form to fit inside coping cap with stiffening bend to prevent flexing.
7. Face Leg Cleats: Concealed, continuous galvanized-steel sheet.

2.6 ROOF-EDGE FLASHINGS

- A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous formed- or extruded-aluminum anchor bar with integral drip-edge cleat to engage fascia cover. Provide matching corner units.
 1. Fascia Cover: Fabricated from the following exposed metal:
 - a. Formed Aluminum: Minimum 0.050 inch thick Thickness as required to meet performance requirements.
 2. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.

2.7 ROOF-EDGE DRAINAGE SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Architectural Products Company.
 2. Berger Building Products, Inc.
 3. Cheney Flashing Company.
 4. Hickman Company, W. P.
 5. Metal-Era, Inc.
 6. Metal-Fab Manufacturing, LLC.
 7. MM Systems Corporation.
- B. Gutters: Manufactured in uniform section lengths not exceeding 12 feet, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
 1. Fabricate from the following exposed metal:
 - a. Formed Aluminum: 0.040 inch thick.
 2. Gutter Profile: As indicated according to SMACNA's "Architectural Sheet Metal Manual."
 3. Gutter Supports: Straps with finish matching the gutters.
- C. Downspouts: Plain rectangular complete with mitered elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
 1. Formed Aluminum: 0.040 inch thick.

D. Parapet Scuppers: Manufactured with closure flange trim to exterior, wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.

1. Fabricate from the following exposed metal:

a. Formed Aluminum: 0.040 inch thick .

E. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout, exterior flange trim, and built-in overflow.

1. Fabricate from the following exposed metal:

a. Formed Aluminum: 0.040 inch thick.

2.8 REGLETS AND COUNTERFLASHINGS

A. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:

1. Stainless Steel: 0.025 inch thick.
2. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
3. Stucco Type, Embedded: Provide reglets with upturned fastening flange and extension leg of length to match thickness of applied finish materials.

B. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal:

1. Formed Aluminum: 0.032 inch thick.

C. Aluminum Finish: Two-coat fluoropolymer .

1. Color: As selected by Architect from manufacturer's full range.

2.9 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water. Overlap edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
- B. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

3.3 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum and stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet self-adhering, high-temperature sheet underlayment or polyethylene sheet.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise shown on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints with elastomeric sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.4 COPING INSTALLATION

- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor copings to meet performance requirements.
 - 1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.
 - 2. Apply double bead of sealant or foam tape to each end of splice plates.
 - 3. Snap cap on to compression cleats to seal against concealed splice plates.
 - 4. Interlock face leg drip edge into continuous cleat anchored to substrate at 16-inch centers or manufacturer's required spacing that meets performance requirements. Anchor back leg of coping with screw fasteners and elastomeric washers at 16-inch centers or manufacturer's required spacing that meets performance requirements.

3.5 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
- B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
 - 1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.
- C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.
 - 1. Provide elbows at base of downspout to direct water away from building.
 - 2. Connect downspouts to underground drainage system indicated.
- D. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
 - 1. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.
 - 2. Loosely lock front edge of scupper with conductor head.
 - 3. Seal or solder exterior wall scupper flanges into back of conductor head.
- E. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below scupper discharge.

3.6 REGLET AND COUNTERFLASHING INSTALLATION

- A. General: Coordinate installation of reglets and counterflashings with installation of base flashings.
- B. Embedded Reglets: See Division 03 Section "Precast Concrete" for installation of reglets.

- C. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.
- D. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with sealant. Fit counterflashings tightly to base flashings.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section includes:
 - 1. Mechanical and electrified door hardware for:
 - a. Swinging doors.
- B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:
 - 1. Windows
 - 2. Cabinets (casework), including locks in cabinets
 - 3. Signage
 - 4. Toilet accessories
 - 5. Overhead doors
- C. Related Sections:
 - 1. Division 01 Section "Alternates" for alternates affecting this section.
 - 2. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
 - 3. Division 09 sections for touchup finishing or refinishing of existing openings modified by this section.
 - 4. Division 13 Section "Radiation Protection" for requirements for lead-lining for door hardware at openings indicated to receive radiation protection.
 - 5. Division 26 sections for connections to electrical power system and for low-voltage wiring.
 - 6. Division 28 sections for coordination with other components of electronic access control system.

1.03 REFERENCES

- A. UL - Underwriters Laboratories
 - 1. UL 10B - Fire Test of Door Assemblies
 - 2. UL 10C - Positive Pressure Test of Fire Door Assemblies
 - 3. UL 1784 - Air Leakage Tests of Door Assemblies
 - 4. UL 305 - Panic Hardware
- B. DHI - Door and Hardware Institute
 - 1. Sequence and Format for the Hardware Schedule
 - 2. Recommended Locations for Builders Hardware
 - 3. Key Systems and Nomenclature
- C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.04 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
 - a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
 - c. Type, style, function, size, and finish of each hardware item.
 - d. Name and manufacturer of each item.
 - e. Fastenings and other pertinent information.
 - f. Location of each hardware set cross-referenced to indications on Drawings.
 - g. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - h. Mounting locations for hardware.
 - i. Door and frame sizes and materials.
 - j. Name and phone number for local manufacturer's representative for each product.
 - k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
 - 1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.
5. Key Schedule:

- a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
 - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 - 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.
- C. Informational Submittals:
1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
 2. Product Certificates for electrified door hardware, signed by manufacturer:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 3. Certificates of Compliance:
 - a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
 - b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.
 - c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.
 4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
 5. Warranty: Special warranty specified in this Section.
- D. Closeout Submittals:
1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - e. Final approved hardware schedule, edited to reflect conditions as-installed.
 - f. Final keying schedule
 - g. Copies of floor plans with keying nomenclature
 - h. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
 - i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.05 QUALITY ASSURANCE

- A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.
 - 1. Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)
 - a. Where no additional products or manufacturers are listed in product category, requirements for "No Substitute" govern product selection.
 - 2. Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.
- B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
 - 1. Warehousing Facilities: In Project's vicinity.
 - 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 - 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 - 4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
 - a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.
- C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.
- D. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 - 1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
 - 2. Can provide installation and technical data to Architect and other related subcontractors.
 - 3. Can inspect and verify components are in working order upon completion of installation.
 - 4. Capable of producing wiring diagrams.
 - 5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.
- E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
 - 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
 - 2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

- G. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
- H. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
- I. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.
- J. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf (22.2 N).
 - 2. Maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - 3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
 - 4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.
- K. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.
 - 1. Attendees: Owner, Contractor, Architect, Installer, and Supplier's Architectural Hardware Consultant.
 - 2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.
 - d. Requirements for access control.
 - e. Address for delivery of keys.
- L. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Inspect and discuss preparatory work performed by other trades.
 - 3. Inspect and discuss electrical roughing-in for electrified door hardware.
 - 4. Review sequence of operation for each type of electrified door hardware.
 - 5. Review required testing, inspecting, and certifying procedures.
- M. Coordination Conferences:
 - 1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
 - a. Attendees: Door hardware supplier, door hardware installer, Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.

2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
 - a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Owner, Architect and Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when coordination conference was held and who was in attendance.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 1. Deliver each article of hardware in manufacturer's original packaging.
- C. Project Conditions:
 1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- D. Protection and Damage:
 1. Promptly replace products damaged during shipping.
 2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
 3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- F. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.07 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Direct shipments not permitted, unless approved by Contractor.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
 - a. Closers:
 - 1) Mechanical: 25 years.
 - b. Automatic Operators: 2 years.
 - c. Exit Devices:
 - 1) Mechanical: 3 years.
 - d. Locksets:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - e. Continuous Hinges: Lifetime warranty.
 - f. Key Blanks: Lifetime
 - 2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.09 MAINTENANCE

- A. Extra Materials:
 - 1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Maintenance Tools:
 - 1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and particular project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
 - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

- D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fasteners

- 1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
- 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
- 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
- 4. Install hardware with fasteners provided by hardware manufacturer.

2.03 HINGES

A. Manufacturers and Products:

- 1. Scheduled Manufacturer and Product: Ives 5BB series
- 2. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series, Stanley FBB Series

B. Requirements:

- 1. Provide five-knuckle, ball bearing hinges conforming to ANSI/BHMA A156.1.
- 2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
- 3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
- 4. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
- 5. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
- 6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
- 7. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

8. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.

2.04 CONTINUOUS HINGES

A. Aluminum Geared

1. Manufacturers:

- a. Scheduled Manufacturer: Ives.
- b. Acceptable Manufacturers: Select, Stanley.

2. Requirements:

- a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
- b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum, with 0.25-inch (6 mm) diameter Teflon coated stainless steel hinge pin.
- c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
- d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
- e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
- f. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
- g. Install hinges with fasteners supplied by manufacturer.
- h. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

- a. Scheduled Manufacturer: Von Duprin EPT-10
- b. Acceptable Manufacturers: ABH PT1000, Securitron CEPT-10

B. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires sufficient to accommodate electric function of specified hardware.

C. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.06 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90

inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.07 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers and surface vertical rod exit device strikes. Factory-prep coordinators for vertical rod devices if required.

2.08 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Sargent 8200 Series
2. Acceptable Manufacturers and Products: Corbin-Russwin ML2000 series, Best 45H series, Schlage L9000 Series.

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1 Operational, Grade 1 Security, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
2. Indicators: Where specified, provide indicator window measuring a minimum 2 inch x 1/2 inch with 180 degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
 - a. Occupied Indicator: Provide indicator above cylinder for visibility while operating the lock that identifies the trims as do not disturb/(blank) status of the door. Indicator in blank (or unoccupied) state has a white background with black text and icon. Indicator in the do not disturb state has a red background with white text and icon.
3. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
4. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
5. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide a request to exit (RX) switch that is actuated with rotation of inside lever.
6. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Lever Design: Sargent LP
 - b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

2.09 AUXILIARY LOCKS

A. Deadbolts:

1. Manufacturers and Products:

- a. Scheduled Manufacturer and Product: Sargent 480 series.
- b. Acceptable Manufacturers and Products: Arrow N series, Best T series, Corbin-Russwin DL3000 series, Falcon D100 series, Schlage B600 series.

2. Requirements:

- a. Provide deadbolt series conforming to ANSI/BHMA A156 and function as specified. Cylinders: Refer to "KEYING" article, herein.
- b. Provide deadbolts with standard 2-3/4 inches (70 mm) backset. Provide 2-3/8 inches (60 mm) where noted or if door or frame detail requires. Provide deadbolt with full 1 inch (25 mm) throw, constructed of steel alloy.
- c. Provide manufacturer's standard strike.

2.10 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 98 Series
2. Acceptable Manufacturers and Products: Detex Advantex Series, Precision Apex series

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to "KEYING" article, herein.
2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Touchpad: Extend minimum of one half of door width. Match exit device finish, stainless steel for US26, US26D, US28, US32, and US32D finishes; and for all other finishes, provide compatible finish to exit device. No plastic inserts are allowed in touchpads.
4. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
5. Provide flush end caps for exit devices.
6. Provide exit devices with manufacturer's approved strikes.
7. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
8. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
9. Provide cylinder dogging at non-fire-rated exit devices where specified.
10. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
11. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
 - a. Lever Style: Match lever style of locksets.
 - b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.
12. Provide UL labeled fire exit hardware for fire rated openings.

2.11 ELECTRIC STRIKES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 6000 series
2. Acceptable Manufacturers and Products: Folger Adam 300 series, HES 1006 series

B. Requirements:

1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary-resistant.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide fail-secure type electric strikes, unless specified otherwise.
5. Coordinate voltage and provide transformers and rectifiers for each strike as required.

2.12 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Sargent Signature
2. Acceptable Manufacturers: No Substitute

B. Requirements:

1. Provide full size interchangeable cylinders/cores to match Owner's existing Sargent Signature key system, compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Replaceable Construction Cores.
 - a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - 1) 2 construction control keys
 - 2) 4 construction change (day) keys.
 - b. Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2.13 KEYING

- A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
- B. Provide cylinders/cores keyed into Owner's existing factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

C. Requirements:

1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
 - a. Grand Master Keying system as directed by the Owner.
2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
3. Provide keys with the following features:

- a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
 - b. Patent Protection: Keys and blanks protected by one or more utility patent(s).
4. Identification:
- a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication "Keying Systems and Nomenclature" for identification. Blind code marks shall not include actual key cuts.
 - b. Identification stamping provisions must be approved by the Architect and Owner.
 - c. Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
 - d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
 - e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
5. Quantity: Furnish in the following quantities.
- a. Change (Day) Keys: 2 per cylinder/core.
 - b. Permanent Control Keys: 2.
 - c. Master Keys: 5.
 - d. Grandmaster Keys: 5

2.14 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4050 series
2. Acceptable Manufacturers and Products: Norton 7500 series, Yale 4400 series.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
3. Closer Body: 1-1/2 inch (38 mm) diameter with 11/16 inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.15 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4600 series
2. Acceptable Manufacturers and Products: Norton 6000 series, Besam Power Swing

B. Requirements:

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI/BHMA A156.19.
2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
5. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check valve, sweep valve, latch valve to control door.
6. Provide drop plates, brackets, or adapters for arms as required for details.
7. Provide hard-wired actuator switches for operation as specified.
8. Provide weather-resistant actuators at exterior applications.
9. Provide key switches with LED's, recommended and approved by manufacturer of automatic operator as required for function described in operation description of hardware group below. Cylinders: Refer to "KEYING" article, herein.
10. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
11. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

2.16 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.17 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
 - a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.18 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson
2. Acceptable Manufacturers: Rixson, Sargent

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.19 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.20 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International
2. Acceptable Manufacturers: National Guard, Reese

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:
 - a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
 - b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.21 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.22 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: LCN
2. Acceptable Manufacturers: Rixson, Sargent

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.23 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Continuous Hinges: BHMA 630 (US32D)
3. Continuous Hinges: BHMA 628 (US28)
4. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
5. Protection Plates: BHMA 630 (US32D)
6. Overhead Stops and Holders: BHMA 630 (US32D)
7. Door Closers: Powder Coat to Match
8. Wall Stops: BHMA 630 (US32D)
9. Latch Protectors: BHMA 630 (US32D)
10. Weatherstripping: Clear Anodized Aluminum
11. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- H. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches (750 mm) of door height greater than 90 inches (2286 mm).
- I. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. **Furnish permanent cores to Owner for installation.**
- J. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.

4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 5. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- S. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 FIELD QUALITY CONTROL

- A. Architectural Hardware Consultant: Engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.04 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.05 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.06 DEMONSTRATION

- A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.07 DOOR HARDWARE SCHEDULE

- A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.
- B. Hardware Sets:

HARDWARE SET NO. H-01

FOR USE ON MARK/DOOR #(S):

108D 119D

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	CD-9849-EO	626	VON
1	EA	PANIC HARDWARE	CD-9849-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	LONG DOOR PULL	9264F 72" STD	630-316	IVE
1	EA	COMPANION MANUAL CLS	4640-ST3066	689	LCN
1	EA	SURF. AUTO OPERATOR	4642 LONG WMS	689	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853	630	LCN
1	EA	BOLLARD POST	8310-866	AL	LCN
1	EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	WEATHERSTRIP BY DOOR/FRAME MANUFACTURER			

PRESSING ACTUATOR WILL ACTIVATE AUTOMATIC OPERATOR AND OPEN ONE DOOR LEAF. VERIFY WHICH LEAF SHALL OPEN.
 COORDINATE WITH ELECTRICAL SYSTEMS.

HARDWARE SET NO. H-01-1

DOOR HARDWARE

FOR USE ON MARK/DOOR #(S):

100H

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	CD-9849-EO	626	VON
1	EA	PANIC HARDWARE	CD-9849-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	LONG DOOR PULL	9264F 72" STD	630-316	IVE
1	EA	COMPANION MANUAL CLS	4640-ST3066	689	LCN
1	EA	SURF. AUTO OPERATOR	4642 LONG WMS	689	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853	630	LCN
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA		WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

PRESSING ACTUATOR WILL ACTIVATE AUTOMATIC OPERATOR AND OPEN RHR LEAF. DOOR TO BE SEQUENCED WITH 100D TO OPEN UPON ACTIVATION OF EXTERIOR ACTUATOR.

COORDINATE WITH ELECTRICAL SYSTEMS.

HARDWARE SET NO. H-02

FOR USE ON MARK/DOOR #(S):

100E 100F 100G 108C 119C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
2	EA	PANIC HARDWARE	CD-9849-EO	626	VON
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
2	EA	LONG DOOR PULL	9264F 72" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	MOUNTING PLATE	4050-18	689	LCN
2	EA	CUSH SHOE SUPPORT	4050-30	689	LCN
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA		WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

HARDWARE SET NO. H-03

FOR USE ON MARK/DOOR #(S):

160A 172B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954	689	VON
1	EA	PANIC HARDWARE	LD-98-EO	626	VON

DOOR HARDWARE

1	EA	PANIC HARDWARE	LD-98-NL	626	VON
1	EA	MORTISE CYLINDER	10-42 (MULLION CYL)		SAR
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MULLION SEAL	8780N	N	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-04

FOR USE ON MARK/DOOR #(S):

179 180

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	STOREROOM OR CLOSET	AV-64-8204 EL	630	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	OH STOP & HOLDER	81H	630	GLY
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	GASKETING	188S-BK	S-BK	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

1. ASTRAGAL SHALL BE FURNISHED BY THE DOOR SUPPLIER.

HARDWARE SET NO. H-05

FOR USE ON MARK/DOOR #(S):

181

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954	689	VON
1	EA	PANIC HARDWARE	CDSI-98-EO	626	VON
1	EA	PANIC HARDWARE	CDSI-98-NL	626	VON
1	EA	MORTISE CYLINDER	10-42 (MULLION CYL)		SAR
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MULLION SEAL	8780N	N	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

DOOR HARDWARE

HARDWARE SET NO. H-06

FOR USE ON MARK/DOOR #(S):

227R 307R ST304R

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM OR CLOSET	64-8204 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-07

FOR USE ON MARK/DOOR #(S):

183A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	FAIL SECURE ELEC LOCK	64-8271 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	MOUNTING PLATE	4050-18	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	PUSHBUTTON CONSOLE	8204		SCE
1	EA	POWER SUPPLY	AS REQUIRED		
1	EA	WEATHERSTRIP BY DOOR/FRAME MANUFACTURER			

DOOR NORMALLY CLOSED AND LOCKED. ENTRY BY KEY AVAILABLE. PUSH BUTTON LOCATED AT SECURITY WILL RELEASE ELECTRIFIED LOCK AND ALLOW FOR ENTRY. DOOR ALWAYS AVAILABLE FOR FREE EGRESS.

COORDINATE WITH ELECTRICAL SYSTEMS.

HARDWARE SET NO. H-08 -

FOR USE ON MARK/DOOR #(S):

136B 137B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
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DOOR HARDWARE

8	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954	689	VON
2	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	MORTISE CYLINDER	10-42 (MULLION CYL)		SAR
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MULLION SEAL	8780N	N	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-08-1

FOR USE ON MARK/DOOR #(S):

ST101A ST102A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954	689	VON
2	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	MORTISE CYLINDER	10-42 (MULLION CYL)		SAR
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MULLION SEAL	8780N	N	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-09

FOR USE ON MARK/DOOR #(S):

130B 182A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD-98-NL	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

CHANGE HINGE QTY TO 3 EACH @ DR#182A. DELETE THE KICKPLATE.

HARDWARE SET NO. H-10

FOR USE ON MARK/DOOR #(S):

123B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM OR CLOSET	64-8204 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	4050 SHCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-11

FOR USE ON MARK/DOOR #(S):

ST203A ST301 ST302

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-17	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-12

FOR USE ON MARK/DOOR #(S):

ST204A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-17	626	VON
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-13

FOR USE ON MARK/DOOR #(S):

ST303A ST304A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-F-LBR-ER36-17-499F-SNB	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 REG	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

HARDWARE SET NO. H-14

FOR USE ON MARK/DOOR #(S):

ST303B ST304B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-17	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-15

FOR USE ON MARK/DOOR #(S):

ST303C ST304C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER

DOOR HARDWARE

1 EA THRESHOLD 655A-MSLA-10 A ZER

HARDWARE SET NO. H-16

FOR USE ON MARK/DOOR #(S):

ST403 ST404

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE LOCK	10U15 LP	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-17

FOR USE ON MARK/DOOR #(S):

122

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-18

FOR USE ON MARK/DOOR #(S):

001A 001B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	DOOR PULL, 1" ROUND	8103EZHD 12" STD	630-316	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

DOOR HARDWARE

1 EA MOUNTING BRACKET 770SPB ZER

HARDWARE SET NO. H-19 -

FOR USE ON MARK/DOOR #(S):

002	111	154	157	158	159
203	213	221	222	225	227A
305	306	311			

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

ADD GASKET 488S @ DR# 306, 311.

HARDWARE SET NO. H-20

FOR USE ON MARK/DOOR #(S):

212

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-21

FOR USE ON MARK/DOOR #(S):

003 155

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
			HARDWARE BY MANUFACTURER		

HARDWARE SET NO. H-22

FOR USE ON MARK/DOOR #(S):

100A 100B 100C

DOOR HARDWARE

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
2	EA	PUSH BAR	9100HD-STD	630-316	IVE
2	EA	LONG DOOR PULL	9264F 72" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	MOUNTING PLATE	4050-18	689	LCN
2	EA	CUSH SHOE SUPPORT	4050-30	689	LCN

HARDWARE SET NO. H-23

FOR USE ON MARK/DOOR #(S):

100D

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
2	EA	PUSH BAR	9100HD-STD	630-316	IVE
2	EA	LONG DOOR PULL	9264F 72" STD	630-316	IVE
1	EA	COMPANION MANUAL CLS	4640-ST3066	689	LCN
1	EA	SURF. AUTO OPERATOR	4642 LONG WMS	689	LCN
1	EA	RELAY/DOOR SEQUENCER	8310-845	689	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853	630	LCN
1	EA	FLUSH MOUNT BOX	8310-867F	689	LCN

PRESSING ACTUATOR WILL ACTIVATE AUTOMATIC OPERATOR AND OPEN LHR LEAF. DOOR TO BE SEQUENCED WITH 100H TO OPEN UPON ACTIVATION OF OUTER ACTUATOR.

COORDINATE WITH ELECTRICAL SYSTEMS.

HARDWARE SET NO. H-24

FOR USE ON MARK/DOOR #(S):

101

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	PANIC HARDWARE	CD-9850-WDC-EO-LBL	626	VON
1	EA	PANIC HARDWARE	CD-9850-WDC-NL-OP-110WD-LBL	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 REG	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES	689	LCN

DOORS HELD OPEN BY MAGNETIC HOLD OPEN. UPON ACTIVATION OF FIRE ALARM, DOORS WILL CLOSE AND LATCH.

COORDINATE WITH ELECTRICAL AND FIRE SYSTEMS.

HARDWARE SET NO. H-25

FOR USE ON MARK/DOOR #(S):

102

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	OH STOP	450S	630	GLY
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-26

FOR USE ON MARK/DOOR #(S):

102A 121B 126 127 128

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRY/OFFICE LOCK	64-10G05 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-27

FOR USE ON MARK/DOOR #(S):

121A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRY/OFFICE LOCK	64-10G05 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-28

DOOR HARDWARE

FOR USE ON MARK/DOOR #(S):

103 133 202 216

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY BED/BATH LOCK	8265 LP	626	SAR
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-29

FOR USE ON MARK/DOOR #(S):

104A 104B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-F-LBR-ER36-17-499F-SNB	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-30

FOR USE ON MARK/DOOR #(S):

104C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	SET	AUTO FLUSH BOLT	FB32	630	IVE
1	EA	PASSAGE LOCK	10U15 LP	626	SAR
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	4050 REG	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS439	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

HARDWARE SET NO. H-31

DOOR HARDWARE

FOR USE ON MARK/DOOR #(S):

104D

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-F-LBR-ER36-17-499F-SNB	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-32

FOR USE ON MARK/DOOR #(S):

105A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	OH STOP	450S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-33

FOR USE ON MARK/DOOR #(S):

106A 107A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	SINGLE CYLINDER	64-486	625	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	DOOR PULL, 1" ROUND	8103EZHD 12" STD	630-316	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-34;

DOOR HARDWARE

FOR USE ON MARK/DOOR #(S):

106B 107B 131C 134C 204 204A
205

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	DOOR PULL, 1" ROUND	8103EZHD 12" STD	630-316	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-35

FOR USE ON MARK/DOOR #(S):

108A 200

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 REG	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES	689	LCN

DOORS HELD OPEN BY MAGNETIC HOLD OPEN. UPON ACTIVATION OF FIRE ALARM, DOORS WILL CLOSE AND LATCH.

COORDINATE WITH ELECTRICAL AND FIRE SYSTEMS.

HARDWARE SET NO. H-36

FOR USE ON MARK/DOOR #(S):

108B 150A 150B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-F-LBR-ER36-17-499F-SNB	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

HARDWARE SET NO. H-37

FOR USE ON MARK/DOOR #(S):

110A 110B 140A 140B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP/HOLDER	WS40	626	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

CONFIRM WALL DETAILS TO ENSURE LOCATION OF HOLD OPEN.

HARDWARE SET NO. H-38

FOR USE ON MARK/DOOR #(S):

112C 146

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-39

FOR USE ON MARK/DOOR #(S):

113A 307M

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-40

FOR USE ON MARK/DOOR #(S):

125A 125B 129

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-41

FOR USE ON MARK/DOOR #(S):

115 171A 211

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

ADD GASKET 188S @ DR# 171A & 211.

HARDWARE SET NO. H-42

FOR USE ON MARK/DOOR #(S):

116A 116B 118A 118B 206A 206B
207A 207B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9266F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP/HOLDER	WS40	626	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-43

FOR USE ON MARK/DOOR #(S):

117A

DOOR HARDWARE

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-44

FOR USE ON MARK/DOOR #(S):

119A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CD-9849-EO	626	VON
1	EA	PANIC HARDWARE	CD-9849-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	LONG DOOR PULL	9264F 72" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 DEL SCUSH	689	LCN
2	EA	MOUNTING PLATE	4050-18	689	LCN
2	EA	CUSH SHOE SUPPORT	4050-30	689	LCN

HARDWARE SET NO. H-45

FOR USE ON MARK/DOOR #(S):

119B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CD-9849-EO	626	VON
1	EA	PANIC HARDWARE	CD-9849-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	LONG DOOR PULL	9264F 72" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	MOUNTING PLATE	4050-18	689	LCN
2	EA	CUSH SHOE SUPPORT	4050-30	689	LCN

HARDWARE SET NO. H-46

FOR USE ON MARK/DOOR #(S):

120

DOOR HARDWARE

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CD-9849-EO	626	VON
1	EA	PANIC HARDWARE	CD-9849-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	MOUNTING PLATE	4050-18	689	LCN
2	EA	WALL STOP/HOLDER	WS40	626	IVE

HARDWARE SET NO. H-47

FOR USE ON MARK/DOOR #(S):

123A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-48

FOR USE ON MARK/DOOR #(S):

124

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ENTRY/OFFICE LOCK	64-10G05 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-49

FOR USE ON MARK/DOOR #(S):

130A 136A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
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DOOR HARDWARE

8	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	WALL STOP/HOLDER	WS40	626	IVE
2	EA	SILENCER	SR64	GRY	IVE

DR# 136A SHALL HAVE A PASSAGE SET.

HARDWARE SET NO. H-50

FOR USE ON MARK/DOOR #(S):

215B 217A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-51

FOR USE ON MARK/DOOR #(S):

215A 217B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-52

FOR USE ON MARK/DOOR #(S):

132 214

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

DOOR HARDWARE

HARDWARE SET NO. H-53

FOR USE ON MARK/DOOR #(S):

142A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-54

FOR USE ON MARK/DOOR #(S):

142B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-55

FOR USE ON MARK/DOOR #(S):

144 145

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	OH STOP	450S	630	GLY
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-56

FOR USE ON MARK/DOOR #(S):

149 156 167A 168

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRY/OFFICE LOCK	64-10G05 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-57

FOR USE ON MARK/DOOR #(S):

147A 165A ST003 ST004

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-17	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-58

FOR USE ON MARK/DOOR #(S):

147B 165B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	DOOR PULL, 1" ROUND	8103EZHD 12" STD	630-316	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

DOOR HARDWARE

HARDWARE SET NO. H-59

FOR USE ON MARK/DOOR #(S):

148A 148B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CREMONE BOLT	1028.00320	603	RIC
			SPECIAL HEIGHT		
2	EA	FLOOR STOP/HOLDER	FS40	US26D	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
2	EA	MOUNTING BRACKET	770SPB		ZER
			HARDWARE BY MANUFACTURER		

HINGES SHALL BE FURNISHED BY THE CUSTOM HOLLOW METAL DOOR SUPPLIER. SEE SECTION 081113
 - CUSTOM HOLLOW METAL DOORS.

HARDWARE SET NO. H-60

FOR USE ON MARK/DOOR #(S):

148C 160C 160D 160E 160F

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
			HARDWARE BY MANUFACTURER		

HARDWARE SET NO. H-61

FOR USE ON MARK/DOOR #(S):

152A 153A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9264F 12" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-62

DOOR HARDWARE

FOR USE ON MARK/DOOR #(S):

152B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9264F 12" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-63

FOR USE ON MARK/DOOR #(S):

153B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9264F 12" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-64

FOR USE ON MARK/DOOR #(S):

160B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	SET	AUTO FLUSH BOLT	FB32	630	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

HARDWARE SET NO. H-65

DOOR HARDWARE

FOR USE ON MARK/DOOR #(S):

162 163

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE LOCK	10U15 LP	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-66

FOR USE ON MARK/DOOR #(S):

164

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRY/OFFICE LOCK	64-10G05 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-67

FOR USE ON MARK/DOOR #(S):

164A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIVACY BED/BATH LOCK	8265 LP	626	SAR
1	EA	OH STOP	450S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-68

FOR USE ON MARK/DOOR #(S):

164B 168B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE LOCK	10U15 LP	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE

DOOR HARDWARE

3 EA SILENCER SR64 GRY IVE

HARDWARE SET NO. H-69

FOR USE ON MARK/DOOR #(S):
166

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	STORE DOOR	64-8226 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-70

FOR USE ON MARK/DOOR #(S):
167B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STORE DOOR	64-8226 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER

HARDWARE SET NO. H-71

FOR USE ON MARK/DOOR #(S):
168A 174 176 178

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY BED/BATH LOCK	8265 LP	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-72

FOR USE ON MARK/DOOR #(S):

DOOR HARDWARE

169A 170A 170B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	SET	AUTO FLUSH BOLT	FB32	630	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

HARDWARE SET NO. H-73

FOR USE ON MARK/DOOR #(S):

172A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CD-9827-EO-LBR-ER36-499F	626	VON
1	EA	PANIC HARDWARE	CD-9827-L-LBR-ER36-17-499F-SNB	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-74 -

FOR USE ON MARK/DOOR #(S):

173 175 177

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ENTRY/OFFICE LOCK	64-10G05 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-75 -

FOR USE ON MARK/DOOR #(S):

DOOR HARDWARE

182B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-NL-F	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-76

FOR USE ON MARK/DOOR #(S):

183B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	ELECTRIC STRIKE	6400 FSE	630	VON
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	POWER SUPPLY	AS REQUIRED		

DOOR NORMALLY CLOSED AND LOCKED. ENTRY BY KEY AVAILABLE. PUSH BUTTON LOCATED AT SECURITY WILL RELEASE ELECTRIC STRIKE AND ALLOW FOR ENTRY. DOOR ALWAYS AVAILABLE FOR FREE EGRESS.

COORDINATE WITH ELECTRICAL SYSTEMS.

HARDWARE SET NO. H-77

FOR USE ON MARK/DOOR #(S):

201A 219A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 SHCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER

DOOR HARDWARE

1 EA MOUNTING BRACKET 770SPB ZER

HARDWARE SET NO. H-78

FOR USE ON MARK/DOOR #(S):

201B 219B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP/HOLDER	WS40	626	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

CONFIRM WALL DETAILS TO ENSURE LOCATION OF WALL STOP

HARDWARE SET NO. H-78-1

FOR USE ON MARK/DOOR #(S):

302B 304B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP/HOLDER	WS40	626	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

CONFIRM WALL DETAILS TO ENSURE LOCATION OF WALL STOP

HARDWARE SET NO. H-79

FOR USE ON MARK/DOOR #(S):

223A 224A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE

DOOR HARDWARE

1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9266F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-80

FOR USE ON MARK/DOOR #(S):

201C 219C 309A 310A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9266F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

CHANGE HINGE QTY @ DR# 309A & 310A

HARDWARE SET NO. H-81

FOR USE ON MARK/DOOR #(S):

220

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9266F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-82

FOR USE ON MARK/DOOR #(S):

309B 310B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR

DOOR HARDWARE

1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-83

FOR USE ON MARK/DOOR #(S):

307 312

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9266F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-84

FOR USE ON MARK/DOOR #(S):

302A 304A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	SURFACE CLOSER	4050 SHCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	MEETING STILE	328AA	AA	ZER
2	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-85

FOR USE ON MARK/DOOR #(S):

302C 304C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9266F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN

DOOR HARDWARE

1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-86

FOR USE ON MARK/DOOR #(S):

301 303

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CD-9827-EO-LBR-ER36-499F	626	VON
1	EA	PANIC HARDWARE	CD-9827-NL-OP-LBR-ER36-110WD-499F-SNB	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
2	EA	MORTISE CYLINDER	10-64-42 (DOGGING CYL)	626	SAR
3	EA	PERMANENT CORE	10-63	626	SAR
2	EA	LONG DOOR PULL	9264F 24" STD	630-316	IVE
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES	689	LCN
2	EA	SILENCER	SR64	GRY	IVE

DOORS HELD OPEN BY MAGNETIC HOLD OPEN. UPON ACTIVATION OF FIRE ALARM, DOORS WILL CLOSE AND LATCH.

COORDINATE WITH ELECTRICAL AND FIRE SYSTEMS.

HARDWARE SET NO. H-87

FOR USE ON MARK/DOOR #(S):

308

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	OH STOP	450S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-88

FOR USE ON MARK/DOOR #(S):

312R

EACH TO HAVE:

DOOR HARDWARE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM OR CLOSET	64-8204 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-89

FOR USE ON MARK/DOOR #(S):

313 314

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	LONG DOOR PULL	9266F 24" STD	630-316	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-90

FOR USE ON MARK/DOOR #(S):

315

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-91

FOR USE ON MARK/DOOR #(S):

316

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
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DOOR HARDWARE

6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-92

FOR USE ON MARK/DOOR #(S):

400A 400B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PASSAGE LOCK	10U15 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER

HARDWARE SET NO. H-93

FOR USE ON MARK/DOOR #(S):

401A 401B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	DOOR PULL, 1" ROUND	8103EZHD 12" STD	630-316	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-94

FOR USE ON MARK/DOOR #(S):

ST101B ST102B ST201 ST202

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-BE-F-LBR-17-499F	626	VON

DOOR HARDWARE

2	EA	SURFACE CLOSER	4050 REG	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES	689	LCN
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

DOORS HELD OPEN BY MAGNETIC HOLD OPEN. UPON ACTIVATION OF FIRE ALARM, DOORS WILL CLOSE AND LATCH.

COORDINATE WITH ELECTRICAL AND FIRE SYSTEMS.

HARDWARE SET NO. H-95

FOR USE ON MARK/DOOR #(S):

ST103A ST104A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-F-LBR-17-499F-SNB	626	VON
1	EA	RIM CYLINDER	10-64-34	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

HARDWARE SET NO. H-96

FOR USE ON MARK/DOOR #(S):

ST103B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-17	626	VON
1	EA	SURFACE CLOSER	4050 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-97

FOR USE ON MARK/DOOR #(S):

ST104B ST203B ST204B

EACH TO HAVE:

DOOR HARDWARE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-17	626	VON
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	MOUNTING BRACKET	770SPB		ZER

HARDWARE SET NO. H-98

FOR USE ON MARK/DOOR #(S):

223B 224B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STOREROOM/CLOSET LOCK	64-10G04 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HINGES SHALL BE FURNISHED BY THE CUSTOM HOLLOW METAL DOOR SUPPLIER. SEE SECTION 081113
 - CUSTOM HOLLOW METAL DOORS.

HARDWARE SET NO. H-99

FOR USE ON MARK/DOOR #(S):

117

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	64-10G37 LP	626	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	770AA	AA	ZER
1	EA	DOOR BOTTOM	369AA6	AA	ZER
1	EA	THRESHOLD	655A-MSLA-10	A	ZER

HARDWARE SET NO. H-100

FOR USE ON MARK/DOOR #(S):

137A

EACH TO HAVE:

DOOR HARDWARE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-BE-F-LBR-ER36-17-499F-SNB	626	VON
2	EA	SURFACE CLOSER	4050 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-BK	ZER
1	EA	MEETING STILE	328AA	AA	ZER

HARDWARE SET NO. H-101

FOR USE ON MARK/DOOR #(S):

131A 134A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM	64-487	625	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 REG	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET NO. H-102

FOR USE ON MARK/DOOR #(S):

131B 134B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM	64-487	625	SAR
1	EA	PERMANENT CORE	10-63	626	SAR
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

END OF SECTION

Item #	Name	Unit	Theatre	Alternate #6
	Dimmer Racks			
1	Installed Rack with 48 Modules	Each	1	
	Modules			
	Standard Noise			
2	2.4 kw ThruPower (2/Module):	Dimmer/Relay	70	
	Relay			
3	20 Amp Relay	Each	26	
	Controlled Motorized Breaker Panel			
4	PanelBoard for 83 Slots - Master 225A Main Breaker	Each	1	
5	Single Pole 20A 120 Volt Motorized Breaker	Each	76	
6	Single Pole 15A 120 Volt UnMotorized Breaker	Each	2	
7	Three Pole 15A 120 Volt UnMotorized Breaker	Each	1	
8	Three Pole 30A 120 Volt UnMotorized Breaker	Each	1	
9	Panel Board Based Surge Supression	Each	1	
	Company Switches			
10	400A Company Switch W/ Connection Chamber	Each	2	
11	100A Company Switch W/ Connection Chamber	Each	1	
12	200A Company Switch - Isolated Ground W/ Connection Chamber	Each	1	
13	100A Company Switch - Isolated Ground W/ Connection Chamber	Each	2	
	Emergency Transfer Switches			
14	Branch Circuit ELTS 1 @ 20A Circuit	Each	6	
15	DMX Emergency Bypass - Wall Mount, 6 output	Each	1	
16	Emergency Bypass Detection Kit	Each	1	
	Busway	Each		
17	100A, 3P busway with mounting brackets and housing coupler	Foot	100	
18	100A cap and end feed	Set	6	
19	225A, 3P busway with mounting brackets and housing coupler	Foot	60	
20	225A cap and end feed	Each	2	
21	Busplug Type MTR20 100A-225A busplug with (1) 20A Three phase breaker (1) L18-20 pigtails	Each	6	

Item #	Name	Unit	Theatre	Alternate #6
22	Busplug Type T3 100A-225A busplug with (3) 20A single phase breakers (3) 20A Stage Pin pigtails.	Each	10	
23	Busplug Type TML 100A-225A busplug with (1) 20a 208v breaker (1) L6-20 receptacle (1) 20A 120v breaker (1) 20A 2p&g pigtail	Each	6	
24	Busplug Type VT1 100A-225A Bus Tap with (7) 20a single pole breakers (1) Socapex Compatible Female (1) Male 20A 2p&G (1) Female 20A 2P&G	Each	10	
Architectural Lighting Controller				
25	House / Work Light - Architectural	Each	1	
26	Entry Station - B1	Each	25	
27	Entry Station - B2	Each	2	
28	Portable Architectural Touchscreen With Ethernet Connection - AR5-A	Each	1	
Architectural Sensors				
29	Occupancy Sensor - Wall Mount PIR Sensor	Each	4	
30	Occupancy Sensor - Ceiling Mount PIR - Small Room	Each	12	
31	Occupancy Sensor - Ceiling Mount PIR - Large Room	Each	4	
32	Occupancy Sensor - Wall Mount PIR Ceiling Mount - High Bay	Each	2	
Console				
Main Consoles				
33	Main Console - 3,000 Channel	Each	1	
Console Accessories				
34	Main Console hook up cable set 25'	Each	1	
35	Monitor - 21" Flatpanel Touchscreen	Each	2	
36	Power Filtration / UPS	Each	1	
37	Wireless Focus Remote WAP	Each	1	
38	Stand w/Monitor Supports: 48"	Each	1	
Data Communications				
DMX				
39	DMX Optical isolator / splitter Per Drawings	Each	1	
40	DMX Digital To Analog Interface	Each	4	
Ethernet				
41	Ethernet Patch Bay - 24 Port	Each	3	

Item #	Name	Unit	Theatre	Alternate #6
42	Ethernet Switch 24 port with POE and Fiber	Each	3	
43	Ethernet Node Desktop With 4 @ DMX, Dimmer Feedback & Focus Remote	Each	1	
44	Ethernet Node - Installed With 4 @ dmx	Each	1	
45	Ethernet Node - Installed With 8 @ dmx	Each	6	
46	Ethernet Node - Portable With 2 @ dmx Output	Each	2	
47	Ethernet Node - Portable With 2 @ dmx Input	Each	1	
48	Ethernet Cable - 3'-0" - Black	Each	58	
49	Ethernet Cable - 3'-0" - Red For Critical Patches	Each	13	
Electronics Racks				
50	Electronics Rack	Each	1	
51	Blank Panels	Lot	1	
52	Vent Panels	Lot	1	
53	Brush Grommet	Lot	1	
54	Cable Management	Lot	1	
55	Internal Shelves	Each	1	
56	Power Filtration / UPS	Each	1	
Stage Edge Marker				
57	Controller	Each		1
58	Marker Channel	Foot		135
Misc Accessories				
Multicable				
59	Multiconnector Breakout to 20 amp connectors as per drawing "MB" 3'-0" Leader, 1'-6" Drops	Each	10	
60	6 Circuit Multicable extension as per drawing "MC" - 75'	Each	10	
Faceplates				
61	A2	Each	4	
62	A3	Each	2	
63	ARSC	Each	20	
64	ARSW	Each	4	
65	B1	Each	5	
66	B2	Each	2	
67	CS19	Each	2	
68	CS30	Each	1	
69	EN2	Each	4	
70	SMC	Each	1	
71	UL2	Each	4	
72	UL3	Each	1	
73	UL4	Each	20	

Item #	Name	Unit	Theatre	Alternate #6
74	UL5	Each	7	
75	ULW6	Each	1	1
76	ULX	Each	7	
Installed Cable				
77	DMX Cable	Lot	1	
78	Architectural Cable	Lot	1	
79	Ethernet Cable	Lot	1	
80	Analog Cable	Lot	1	
Training				
81	Training at times and dates to be mutually agreed upon with owner.	Hour	8	
Supplemental				
82	Control wire & Terminations for Architectural Fixtures	Lot	1	
83	Materials, devices, and labor required to complete the system in addition to those items outlined above.	Lot	1	
84				
85				
86				
87				
88				
89				
Total				
AR=As Required Per Plans and Specifications				
D:\Dropbox (TheatreConsultantsCo)\TCC Projects\ColumbiaCty-16\CD\Spe				
November 9, 2017				
End Of Section				

APPENDIX B – MAJOR EQUIPMENT LIST

MAIN THEATER / LOBBY AND FACILITY			
<u>ITEM</u>	<u>MFR</u>	<u>MODEL</u>	<u>QTY</u>
SIDE ARRAY			
Loudspeaker	DNB	Y8/12	20
Loudspeaker Array Rigging	DNB	Y Rigging Grid (flying frame)	4
Loudspeaker	DNB	Y Sub	4
Amplifier	DNB	30D	7
Loudspeaker Other Rigging	CUS	By Contractor	2
Termination - Side Proscenium Loudspeaker	CUS	per drawing BB	2
CENTER ARRAY			
Loudspeaker	DNB	Y8/12	10
Loudspeaker Array Rigging	DNB	Y Rigging Grid (flying frame)	1
Amplifier	DNB	30D	2.5
Loudspeaker Additional Rigging	CUS	By Contractor	1
Termination - Center Proscenium Loudspeaker	CUS	per drawing BA	1
DECK SUBWOOFER			
Subwoofer	DNB	J-SUB	4
Amplifier	DNB	30D	2
Termination - Subwoofer Loudspeaker	CUS	per drawing BM	2
FRONT FILL / PORTABLE			
Loudspeaker - Pit Rail	DNB	E5	6
Amplifier	DNB	10D	1
Front Fill Mounting	CUS	By Contractor	8
Termination - Pit Rail Loudspeaker	CUS	per drawing BE	2
FRONT FILL / FIXED			
Loudspeaker Stage Lip	DNB	E6	5
Loudspeaker	DNB	E6 Swivel Bracket	5
Amplifier	DNB	10D	1
Front Fill Mounting	CUS	By Contractor	5
Termination - Front Fill Loudspeaker Stage Lip	CUS	per drawing BD	5
SIDE BOX - LOWER			
Loudspeaker	DNB	E6	4
Loudspeaker	DNB	E8 Horizontal Bracket	4
Amplifier	DNB	10D	0.5
Termination - Box Seat Loudspeaker	CUS	per drawing BG	4
SIDE BOX - 1st BALC			
Loudspeaker	DNB	E6	6
Loudspeaker	DNB	E8 Horizontal Bracket	4
Amplifier	DNB	10D	1.5
Termination - Box Seat Loudspeaker	CUS	per drawing BG	4
SIDE BOX - 2nd BALC			
Loudspeaker	DNB	E6	6

Loudspeaker	DNB	E8 Horizontal Bracket	4
Amplifier	DNB	10D	1.5
Termination - Box Seat Loudspeaker	CUS	per drawing BG	4
UNDER BALCONY - LOWER			
Loudspeaker	DNB	E6 Horizontal Bracket	9
Loudspeaker	DNB	E6	9
Amplifier	DNB	10D	2.25
Termination - Under Balcony Loudspeaker	CUS	per drawing BF	9
UNDER BALCONY - UPPER			
Loudspeaker	DNB	E6	8
Loudspeaker	DNB	E6 Horizontal Bracket	8
Amplifier	DNB	10D	2
Termination - Under Balcony Loudspeaker	CUS	per drawing BF	8
OVER BALCONY			
Loudspeaker	DNB	Y8/12	3
Loudspeaker Additional Rigging	CUS	By Contractor	3
Amplifier	DNB	30D	0.5
Termination - Over Balcony Loudspeaker	CUS	per drawing BH	4
PORTABLE SPEAKERS			
Loudspeaker Portable	DNB	E8	4
Loudspeaker Portable	DNB	E12	4
Loudspeaker Portable	DNB	E15X-SUB	2
Amplifier	DNB	10D	4
SOUNDTRACK PLAYBACK			
Loudspeaker Portable	DNB	E6	16
Loudspeaker Portable	DNB	E8	6
Amplifier	DNB	10D	4
Termination - Surround Loudspeaker	CUS	per drawing BN	39
HOUSE MIX / PROCESSING			
Console	YAM	CL5	1
Console - Stage Box	YAM	RIO 3224-D	1
Console - Stage Box	YAM	RIO 1608-D	1
Console - PSU	YAM	PW800W	1
Console - PSU link Cable	YAM	PSL360	1
Console - gooseneck lamp	YAM	LA1L	3
Portable Rack - Power Supply	CUS		2
PLAYBACK / RECORDING			
Compact Disc Player/Bluetooth Receiver	TAS	CD-200BT	2
Portable Rack - Playback	CUS	Per drawing AV4.11	1
Show Control Software (Audio/Video/MIDI)	FIG	Qlab Professional Bundle	1
Computer Assembly	APL	per drawing TBD	1
THUNDERBOLT TO ANALOG AUDIO INTERFACE			
Interface Cable	WWD	per drawing AV4.11	1
STAGE MIX / PROCESSING			
Console	YAM	CL3	1
Console	YAM	PW800W	1

Console	YAM	PSL360	1
Console	YAM	LA1L	3
Console	YAM	case	1
Portable Rack - Power Supply	CUS	per drawing xx	1
Console Stand	QLK	WS-550	1
STAGE MONITORS			
Loudspeaker Portable	DNB	E15X Sub	1
Loudspeaker Portable	DNB	MAX2	12
Loudspeaker Portable	DNB	10D	4
Loudspeaker Portable	DNB	V7P	2
Portable Rack - Amplifiers	CUS	per drawing xx	1
Loudspeaker Cable	WWD	JHA-NL4-10F	4
Loudspeaker Cable	WWD	JHA-NL4-50F	16
Loudspeaker Cable	WWD	JHA-NL4-100F	8
Loudspeaker Cable Adapter	WWD	NL4MMX	12
STAGE INTERFACE			
Hub - Stage Junction Rack	CUS	per drawing ZA	2
Stagebox	YAM	Rio3224-D	2
UHF Wireless handheld transmitter with BETA 58A	SHU	ULXD2/B58	8
UHF digital wireless bodypack transmitter with miniature 4-pin connector	SHU	ULXD1	8
UHF Quad Channel Wireless System Receiver	SHU	ULX-D4Q	2
dante to analog out 32 channel	ATT	UND32	2
Rack Mount Lamp double	LIT	RL-10-D	2
Drawer with Lock 4 RU	MAP	D4-LK	4
Rack Panel - Accessory Receptacles	CUS	per drawing AV4.12	1
Rack Panel - Amplifier Output Patch	CUS	Per drawing AV4.11	1
Rack Panel - Loudspeaker Location Patch	CUS	Per drawing AV4.11	3
Patch Cable - SpeakOn 2ft	WWD	JHA-NL4-M/F-02F	16
Patch Cable - BNC 2ft	AAI	VBNC-24	16
Distribution Amplifier HD-SDI 1x4	EXT	MDA 4V HD-SDI	5
DSP	BSS	BLU-326	1
Patch Bay	AAI	WEP-262-EO-SH-JSK	6
Patch Cable 2 foot Red	AAI	622A	32
Patch Cable 4 foot Grey	AAI	624C	16
Patch Cable Holder	AAI	PCH-X	2
Video Patchbay	AAI	BNC-32	4
UPS Line Interactive	MAP	UPS-2200R	2
FIBER PATCHBAY	BBI	JPM385A	2
SMPTE 304M CAM patch panel	GEP	HMD2A-6S	1
Switch	CIS	SG300 28 Port	4
NETWORK PATCH BAY CAT 6A	BBI	JPMT700A	7
Termination - Down Stage	CUS	per drawing AA	2
Termination - Up Stage	CUS	per drawing AB	2
Termination - Up Stage Center	CUS	per drawing AC	1
Termination - Orchestra Pit (wall)	CUS	per drawing AD	2
Termination - Orchestra Pit Conductor (floor)	CUS	per drawing AE	1

Termination - Orchestra Pit (floor)	CUS	per drawing AF	2
Termination - Camera	CUS	per drawing AQ	3
Termination - Truck Dock Panel	CUS	per drawing AT	1
Termination - Aux Interface, Stage	CUS	per drawing AU	10
Termination - Display	CUS	per drawing AV	2
CONTROL BOOTH			
Hub - Systems Control Rack	CUS	per drawing ZB	2
Rack Audio Monitor	FOS	RM-3	1
Rack Mount Lamp double	LIT	RL-10-D	3
DSP	BSS	BLU-806	1
Rack Panel - Accessory Receptacles	CUS	per drawing xxx	1
Patch Bay	AAI	WEP-262-EO-SH-JSK	6
Patch Cable 2 foot Red	AAI	622A	24
Patch Cable 4 foot Grey	AAI	624C	16
Patch Cable Holder	AAI	PCH-X	2
Video Patchbay	AAI	BNC-32	4
UPS Line Interactive	MAP	UPS-2200R	2
FIBER PATCHBAY	BBI	JPM385A	2
SMPTE 304M CAM patch panel	GEP	HMD2A-6S	1
Switch	CIS	SG300 28 Port	4
NETWORK PATCH BAY CAT 6A	BBX	JPMT700A	6
Drawer with Lock 4 RU	MAP	D4-LK	3
Booth Monitors	EAW	UB12Si	4
Amplifier 4chan Convection cooled	QSC	SPA4-60	2
Rackmount Keyboard/Mouse	MAP	RM-KB	1
VESA Mount for Monitor	MAP	RM-LCD-PNLK	1
Loudspeaker Mount	CUS	By Contractor	4
Software Programming	CUS	as needed	1
Termination - Control Booth	CUS	per drawing AK	1
Termination - Control Booth Monitor	CUS	per drawing BJ	4
RACK ROOM			
Hub - Systems Amplifier Rack	CUS	per drawing ZC	3
Hub - Loudspeaker Transition Panel	CUS	per drawing ZD	1
Rack Audio Monitor	FOS	RM-3	1
Rack Mount Lamp double	LIT	RL-10-D	3
Rack Panel - Accessory Receptacles	CUS	per drawings	1
Rack Panel - Amplifier Output Patch	CUS	per drawings	2
Rack Panel - Loudspeaker Location Patch	CUS	per drawings	5
Patch Cable - SpeakOn 2ft	WWD	JHA-NL4-M/F-02F	24
Video Patchbay	AAI	BNC-32	1
UPS Line Interactive	MAP	UPS-2200R	1
FIBER PATCHBAY	BBI	JPM385A	1
Switch	CIS	SG300 28 Port	4
NETWORK PATCH BAY CAT 6A	BBI	JPMT700A	1
Patch Bay	AAI	WEP-EO-C-26-N-2-D	3
Patch Cable 2 foot Red	AAI	622A	16
Patch Cable 3 foot Green	AAI	623D	8

DSP	BSS	BLU-806	3
DSP	BSS	BLU-BOB	4
Drawer with Lock 4 RU	MAP	D4-LK	1
Patch Cable Holder	AAI	PCH-X	2
ADA COMPLIANT SYSTEMS			
Coaxial Dipole Remote Antenna (72 Mhz)	LSN	LA-116	1
Intelligent DSP RF Receiver 12-Pack incl. battery, lanyard and ear speaker and charging tray	LSN	LR-41-072-01	5
Replacement rechargeable li-ion battery for LR-4200/5200	LSN	LA-365	10
Intelligent Ear Phone/Neck Loop Lanyard for LR-4200/5200	LSN	LA-430	14
IR or RF Stereo Headphones	LSN	LA-402	30
Replacement Leatherette cushions for LA-402 (qty.10)	LSN	LA-432	1
IR or RF ADA Compliance Signage	LSN	LA-304	1
Termination - Antenna	CUS	per drawing CN	1
LIVE ROOM MICROPHONE			
Microphone MS	SHU	VP88	1
Stereo Microphone Extension Cable	SHU	C110	1
Mounting Assembly - Clamp	CUS	By Contractor	1
Termination - Live Room Microphone	CUS	per drawing AI	1
INTERCOM			
4 wire interface	CLC	IF-4W4	2
Remote Rack Station 4chan	CLC	RM-704	2
RCS Programming	CLC	RCS-WIN free of charge on website	2
Power Supply 4chan rack mount	CLC	PS-704	2
Portable Intercom Loudspeaker & Enclosure	CLC	KB-701 with V-BOX	4
Remote Belt Pack single channel	CLC	RS-701	12
Remote Belt Pack 6 pin dual	CLC	RS-702	4
Belt Pack Adapter 2x3 pin to 6 pin	CLC	YC-36	4
Remote Belt Pack Programming	CLC	VPC-1	20
Gooseneck Panel Mic 18inch	CLC	GM-18	2
Handset	CLC	HS-6	2
Headset-Single Muff 4pin female XLR	CLC	CC-300-X4	24
Headset-Double Muff 4pin female XLR	CLC	CC-400-X4	8
Call Signal Flasher	CLC	FL-7	2
Walkie-Talkie Interface	CLC	TW-47	1
PAGE & PROGRAM / FIXED			
Microphone	AKG	D58E	2
SELECT 4/VOLUME CONTROL	BSS	EC-4BV	6
VOLUME CONTROL	BSS	EC-V	4
SELECT 8/VOLUME CONTROL	BSS	EC-8BV	1
8 CHANNEL DANTE AMPLIFIER	YAM	XMV8140D	2
DSP PROGRAMMING	BSS	\$5000 Allowance	1
Chime Player	TAS	SS-CDR200	1
PAGE / PORTABLE			

Portable Rack - Stage Manager	CUS	per drawing	1
Rack Audio Monitor	FOS	RM-3	1
Rack Mount Lamp double	LIT	RL-10-D	1
Remote Rack Station 4chan	CLC	RM-704	1
2x2 Dante interface	ATT	unDIO2x2	1
Rackmount Mixer	ASH	MX-406	1
Rack Panel - Mixer In/Out	CUS	per drawing	1
Rack Panel - SM Rack Control Panel	CUS	per drawing	1
Rack Panel - Page Initiation	CUS	per drawing	1
Video Monitor	MAR	V-MD434	1
Gooseneck Panel Mic 18inch	CLC	GM-18	1
Interface Cable	CUS	per drawing	1
Termination - Stage Manager	CUS	per drawing CC	2
BACKSTAGE			
Ceiling Loudspeaker	SDT	CM-42-EZS-II-WH	40
SURFACE MOUNT LOUDSPEAKER	SDT	SM52-EZ-WH	1
Termination - Backstage Loudspeaker Zone 1	CUS	per drawing BO	24
Termination - Backstage Loudspeaker Zone 2	CUS	per drawing BP, BQ	17
Termination - Backstage Volume Control	CUS	per drawing CK	10
Termination - Backstage PAGING	CUS	per drawing CG	2
LOBBY			
Loudspeaker Portable	DNB	E12	2
Amplifier	DNB	10D	0.5
Ceiling Loudspeaker	SDT	CM-42-EZS-II-WH	41
Surface Mount Loudspeaker	DNB	E8	3
Termination - Lobby Loudspeaker Zone 2	CUS	per drawing BU	41
Termination - Lobby Loudspeaker Zone 1	CUS	per drawing BT	13
Termination - Lobby Systems Control	CUS	per drawing CF	2
Termination - Lobby AV interface	CUS	per drawing LA	2
WIRED MICS			
Microphone Dynamic Cardioid	SHU	SM57-LC	8
Microphone Windscreen 57	SHU	A81WS-BLK	8
Microphone Dynamic Cardioid Vocal	SHU	SM58-LC	8
Microphone Windscreen 58	SHU	A58WS-BLK	8
Microphone Condenser Cardioid	SHU	SM81-LC	4
Microphone Windscreen 81	SHU	A81WS-BLK	4
Microphone Condenser Cardioid Vocal	SHU	Beta 87C	2
Microphone Dynamic Supercardioid Kick	SHU	Beta 52A	2
Microphone Dynamic Supercardioid	SHU	Beta 56A	6
Microphone Condenser Cardioid/Super Vocal	SHU	KSM9/CG	2
Microphone Condenser Mid Side	SHU	VP88	1
Microphone Extension Cable 2ch	SHU	C110	1
Microphone Condenser Supercardioid Lavalier	SHU	WL184	8
Microphone Dynamic Cardioid Kick	AKG	Rhythm-Pack(D112, D40, C430)	1
Microphone Large-diaphragm Condenser Matched Pair w/9 switchable polar patterns with stand mount, shock mount, pop screen, windscreen, carry case	AKG	C414 XLII MATCHED PAIR	1

Microphone Condenser Side Cardioid	ATN	AT4033/CL	2
Microphone Condenser Side Multi-pattern	ATN	AT4050	2
Microphone Condenser Hemi Boundary	CRN	PCC-160	6
Microphone Condenser Omni	NEU	KM 183 mt	4
Microphone Condenser Cardioid	NEU	KM 184 mt	4
Microphone Condenser Side Cardioid	NEU	TLM 103 mt	2
Microphone Dynamic Cardioid Drums clip-on	SEN	e604	4
Microphone Dynamic Cardioid	SEN	MD421 II	8
Piano Pickup Transducer	CDU	CPS-8P	2
Direct Box	WWD	DIRECT-JT	2
Direct Box	WWD	DIRECTOR	8
Direct Box	WWD	HOT BOX	4
Direct Box	WWD	PCDI	4
Direct Box Cable 6ft	WWD	L06	4
WIRELESS MICS			
UHF Dig Wls HH transmitter with BETA 58A	SHU	ULXD2/B58	8
UHF Digl Wls bodypack TX	SHU	ULXD1	4
UHFD Quad Channel Wireless System Receiver	SHU	ULX-D4Q	2
Microphone Condenser Omni Earset TA4F	SHU	WCE6ix	4
Microphone Condenser Supercardioid Lavalier	SHU	WL184	4
Antenna Active Directional	SHU	UA874-USTV	4
Termination - Antenna	CUS	per drawing CN	4
STANDS / CABLES / ACCESSORIES			
Microphone Stand 35-63in & Boom 33in	KNM	21060.500.87	10
Microphone Stand 35-63in & Boom 18-30in	KNM	210/9	10
Microphone Stand 11in & Boom 21in	KNM	25910-500-55	6
Microphone Stand 42-65in	USS	Pro-T-T	8
Microphone Case	SKB	3i-2015-MC24	2
Microphone Cables on Reel	WWD	JHA-LCR-10F-50	1
Microphone Cables on Reel	WWD	JHA-LCR-30F-30	1
Microphone Cables on Reel	WWD	JHA-LCR-50F-20	1
Microphone Sub Snake	WWD	MS-12-0-NR-050-SS	4
Loudspeaker Stand 62-110in	USS	TS-99B	4
Press Box with Case	WWD	PRESSPOWER 2	1
MAINTENANCE			
Tool Kit	JEN	JTK-16GC	1
Cable Tester	WWD	MCT-7	2
Audio Video Service Kit	CAG	SK-AV35	2
Contact Burnisher TRS	AAI	MAXI-BT	1
Contact Injector TRS	AAI	MAXI-IT	1
VIDEO DISTRIBUTION			
Camera Control with 7 discrete control ports, 14 presets, joystick	VAD	ProductionVIEW Precision Camera Control	1
IR Camera 1/2" CCd Super Cube DSP monochrome	IKE	ICD-49	1
IR Illuminator	AXS	T90B IR-LED Illuminator	1
Digital Signage Player	SPX	HMP300	7

Digital Signage Software	SPX	Elementi M	1
Camera Streaming encoder	EXT	SMP111	1
Camera Color PTZ HD/SD	PAN	AW-HE130	1
HD-SDI Matrix	BMD	Smart Videohub 20x20	1
Scaler with SDI out	EXT	DVS605-D	1
HDMI/Stereo Audio Twisted Pair Receiver 330'	EXT	DTP HDMI 4K 330 RX	4
HDMI/Stereo Audio Twisted Pair Transmitter 330'	EXT	DTP HDMI 4K 330 TX	4
LCD Monitor 7in Dual Wide 1024X600 HDMI/3G-SDI, component, composite inputs and loop-through	MRE	M-LYNX-702	1
LCD 17" RM Monitor with Dual HDSDI inputs 1920x1080	MRE	V-LCD17HR-2HD	2
Quad View 17" native resolution 4k quad 3GSDI	MRE	QVW-1708-3G	1
Termination - Camera	CUS	per drawing AQ	4
VIDEO DISPLAYS			
LED LCD Display 40in 1080p	SAM	LH40DCEPLGA/GO	8
LED LCD Display 48In 1080p for box office portrait mt	SAM	LH48DCELGA/GO	1
LED LCD Display 65in 1080p	SAM	LH65DMEPLGA/GO	15
VIDEO & CINEMA PROJECTION			
Projector 4K LED 27000 lumen	DPI	INSIGHT DUAL LASER 4K	1
Rigging Frame	DPI	Rigging Frame	1
Lens for Projektor, Contractor Propose	DPI	Lens (model by contractor)	1
Stage Screen Kit 16:9, 17' x 30 w/front and rear material	DRA	Stage Screen Kit	1
Termination - Projection	CUS	per drawing AN	1
COMPUTER CONTROL & MONITORING			
Rackmount Computer (\$900 Allowance)	DEL	TBD	1
Control System	CST	CP3	1
7" Touch Screen	CST	TSW-760	1
Rackmount panel for touchpanel	CUS	by contractor	1
Software Programming	CUS	as needed	1
MULTI-PURPOSE ROOM EQUIPMENT			
PORTABLE SPEAKERS			
Loudspeaker Portable	QSC	K8	6
Loudspeaker Portable	QSC	K8 TOTE	6
Loudspeaker Portable	QSC	KW122	4
Loudspeaker Portable	QSC	KW122 COVER	4
Loudspeaker Portable	QSC	KW181	4
Loudspeaker Portable	QSC	KW181 COVER	4
Loudspeaker Portable	ULT	TS-110BL	8
	WWD	JHA-NL4-10F	4
Loudspeaker Cable	WWD	JHA-NL4-50F	12
Loudspeaker Cable	WWD	JHA-NL4-100F	8
Loudspeaker Cable Adapter	WWD	NL4MMX	12
PORTABLE MIX STATION			

Console	YAM	TF1	2
Console	YAM	TIO 1608-D	2
Console	YAM	NY64D	2
Console	YAM	RK5014	2
Console	YAM	TF1 COVER	2
Portable Rack	GAT	FLIGHT CASE FOR CONSOLE	2
Portable Rack	GAT	CASE FOR TIO	2
PLAYBACK / RECORDING			
Compact Disc Player/Bluetooth Receiver	TAS	CD-200BT	4
Compact Disc Recorder/Player	TAS	CD-RW901MKII	2
Portable Rack - Playback	CUS	PLAYBACK+RF	2
UHF Wireless handheld transmitter with BETA 58A	SHU	ULXD2/B58	8
UHF digital wireless bodypack transmitter with miniature 4-pin connector	SHU	ULXD1	8
UHF Quad Channel Wireless System Receiver	SHU	ULX-D4Q	2
Interface Cable	WWD	PLAY/REC TO/FROM CONSOLE	2
EQUIPMENT RACK GEAR			
Hub - Stage Junction Rack	CUS	per drawing Z?	1
UHF Wireless handheld transmitter with BETA 58A	SHU	ULXD2/B58	4
UHF digital wireless bodypack transmitter with miniature 4-pin connector	SHU	ULXD1	4
UHF Quad Channel Wireless System Receiver	SHU	ULX-D4Q	1
Rack Mount Lamp double	LIT	RL-10-D	2
Drawer with Lock 4 RU	MAP	D4-LK	1
Patch Cable - BNC 2ft	AAI	VBNC-24	8
Distribution Amplifier HD-SDI 1x4	EXT	MDA 4V HD-SDI	3
DSP	BSS	BLU-806	1
8 CHANNEL DANTE AMPLIFIER	YAM	XMV8140D	3
Video Patchbay	AAI	BNC-32	1
UPS Line Interactive	MAP	UPS-2200R	1
FIBER PATCHBAY	BBI	JPM385A	2
Switch	CIS	SG300 28 Port	4
NETWORK PATCH BAY CAT 6A	BBI	JPMT700A	4
Termination - Down Stage	CUS	per drawing GJ	8
Termination - Up Stage	CUS	per drawing GH	2
Termination - Up Stage Center	CUS	per drawing GX	2
Termination - Down Stage	CUS	per drawing CM	2
ADA COMPLIANT RF SYSTEMS			
Coaxial Dipole Remote Antenna (72 Mhz)	LSN	LA-116	1
3 CHANNEL TRANSMITTER RF	LSN	LT-803-072-01	1
Intelligent DSP RF Receiver 12-Pack incl. battery, lanyard and ear speaker and charging tray	LSN	LR-41-072-01	1

Replacement rechargeable li-ion battery for LR-4200/5200	LSN	LA-365	4
Intelligent Ear Phone/Neck Loop Lanyard for LR-4200/5200	LSN	LA-430	5
Replacement Leatherette cushions for LA-402 (qty.10)	LSN	LA-432	1
IR or RF ADA Compliance Signage	LSN	LA-304	1
Termination - Antenna	CUS	per drawing CN	2
MULTI-PURPOSE			
Ceiling Loudspeaker	SDT	CM-42-EZS-II-WH	12
CONTROL PANEL	BSS	BLU-10BLK	2
Termination - Loudspeaker Zone 1	CUS	per drawing EU	12
Termination - CONTROL PANEL	CUS	per drawing GX	2
VIDEO DISTRIBUTION			
HD-SDI Matrix	BMD	Smart Videohub CleanSwitch 12x12	1
VIDEO & CINEMA PROJECTION			
Projector Laser 6500 Lumen WUXGA	EPS	PRO1505U	1
Screen 9ft x 16ft	DAL	NLCV120X192	1
MUSEUM EQUIPMENT			
PORTABLE MIX STATION			
Console	MCK	1604 VLZ4	1
Console	MCK	ROTOPOD	1
Console	MCK	RACK EARS	1
Console	GAT	G-TOUR 10X12 PU	1
Headphones	SNY	MDR-7506	1
Drawer with Lock 3 RU	MAP	D3-LK	1
PLAYBACK / RECORDING			
Compact Disc Player/Bluetooth Receiver	TAS	CD-200BT	1
MUSEUM AUDIO			
Hub - Stage Junction Rack	CUS	per drawing ZF	1
UHF Wireless handheld transmitter with BETA 58A	SHU	ULXD2/B58	2
UHF digital wireless bodypack transmitter with miniature 4-pin connector	SHU	ULXD1	2
UHF Dual Channel Wireless System Receiver	SHU	ULX-D4D	1
Rack Mount Lamp double	LIT	RL-10-D	2
Drawer with Lock 4 RU	MAP	D4-LK	1
DSP, Dante w/8 in 8 out analog	BSS	BLU-806DA	1
Loudspeaker Portable	QSC	K10.2	2
Loudspeaker Portable	QSC	K10 TOTE	2
Loudspeaker Portable - stand	ULT	TS-110BL	2
2 Channel, 70V amplifier 100W/Ch	EXT	XPA 1002	2
Video Patchbay	AAI	BNC-32	1
Network Patchbay	BBX	JPM816A-HD	1
FIBER PATCHBAY	BBI	JPM385A	1
Switch	CIS	SG300 10 Port	2

AUDIO VIDEO SYSTEMS

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NETWORK PATCH BAY CAT 6A	BBI	JPMT700A	1
Ceiling Loudspeaker	SDT	CM-42-EZS-II-WH	8
XLR patch panel - tie lines	CUS	By Contractor	1
Termination - Wall Interface	CUS	per drawing GA	3
Termination - Control panel	CUS	per drawing FX	2
Termination - ceiling loudspeaker	CUS	per drawing HO	8
Termination - Wireless antenna	CUS	per drawing GM	2
ADA COMPLIANT RF SYSTEMS			
Coaxial Dipole Remote Antenna (72 Mhz)	LSN	LA-116	1
RF Transmitter & Supply 72 MHz	LSN	LT-800-072-01	1
Intelligent DSP RF Receiver 12-Pack incl. battery, lanyard and ear speaker and charging tray	LSN	LR-41-072-01	1
Replacement rechargeable li-ion battery for LR-4200/5200	LSN	LA-365	4
Intelligent Ear Phone/Neck Loop Lanyard for LR-4200/5200	LSN	LA-430	5
Replacement Leatherette cushions for LA-402 (qty.10)	LSN	LA-432	1
IR or RF ADA Compliance Signage	LSN	LA-304	1
Termination - Antenna	CUS	per drawing GN	1
MUSEUM CONTROL			
CONTROL PANEL	BSS	BLU-10BLK	1
Termination - CONTROL PANEL	CUS	per drawing IX	1
STANDS / CABLES / ACCESSORIES			
Microphone Stand	KNM	201-2	3
Microphone Cable 10'	WWD	JHA-QMC-10F	6
Microphone Cable 20'	WWD	JHA-QMC-20F	6
Microphone Cable 30'	WWD	JHA-QMC-30F	6
Microphone Cable 50'	WWD	JHA-QMC-50F	4
Console	MCK	1604 VLZ4	1
Console	MCK	ROTOPOD	1
Console	MCK	RACK EARS	1
Console	GAT	G-TOUR 10X12 PU	1
Headphones	SNY	MDR-7506	1
Drawer with Lock 3 RU	MAP	D3-LK	1

END OF APPENDIX B