

SECTION 00 0107
SEALS PAGE

DESIGN PROFESSIONALS OF RECORD

A. CIVIL ENGINEER:

KELSEY LEWIS

KIMLEY HORN

FLORIDA REGISTRATION # 79384



B. LANDSCAPE ARCHITECT:

CHARLIE JOHNSON

KIMLEY HORN

FLORIDA REGISTRATION # LA6667402



END OF SECTION

B. STRUCTURAL ENGINEER:

MICHAEL E. CORRIN

STANLEY D. LINDSEY & ASSOCIATES, LTD

FLORIDA REGISTRATION #62025



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Michael E. Corrin, P.E.
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Michael E. Corrin

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DN: cn=Michael E. Corrin, o=Stanley D. Lindsey & Associates,
c=US
Reason: I have reviewed this document
Date: 2021.12.02 09:26:35-0800

C. ARCHITECT:

ERIC SNYDER

GRESHAM SMITH

FLORIDA REGISTRATION #96197



Reason: This item has been digitally signed and sealed by Eric Snyder on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Contact Info:

843-364-3494

Date: 2021.12.06

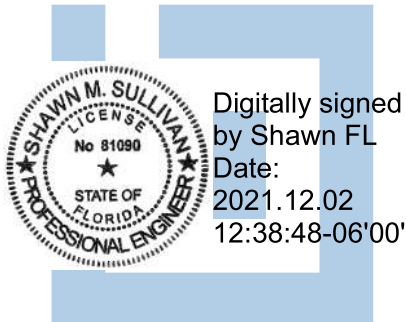
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E. MECHANICAL / PLUMBING / FIRE PROTECTION ENGINEER:

SHAWN SULLIVAN

I.C. THOMASSON ASSOCIATES, INC.

FLORIDA REGISTRATION #81090

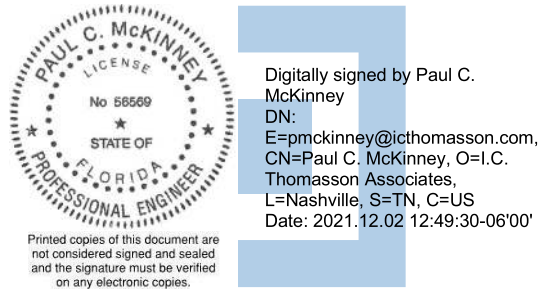


F. ELECTRICAL ENGINEER:

PAUL C. MCKINNEY

I.C. THOMASSON ASSOCIATES, INC.

FLORIDA REGISTRATION #56569



END OF SECTION

SERIES 00 DOCUMENTS – PROCUREMENT AND CONTRACTING REQUIREMENTS

PROCUREMENT REQUIREMENTS

00 0107	Seals Page	CD's; 12/06/2021
00 0110	Table of Contents	CD's; 12/06/2021
00 2150	HCA Preferred Vendors and Manufacturers	CD's; 12/06/2021
00 2151	HCA Preferred Vendor List	CD's; 12/06/2021

SPECIFICATIONS

DIVISION 01 - GENERAL REQUIREMENTS

01 1000	Summary	CD's; 12/06/2021
01 2500	Substitution Procedures	CD's; 12/06/2021
01 2501.01	Substitution Request Form	CD's; 12/06/2021
01 3100	Project Management and Coordination	CD's; 12/06/2021
01 3200	Construction Progress Documentation	CD's; 12/06/2021
01 3300	Submittal Procedures	CD's; 12/06/2021
01 3324	Structural Submittals	CD's; 12/06/2021
01 4000	Quality Requirements	CD's; 12/06/2021
01 4113.01	Florida Codes and Standards	CD's; 12/06/2021
01 4524	Structural Testing	CD's; 12/06/2021
01 5000	Temporary Facilities and Controls	CD's; 12/06/2021
01 5639	Temporary Tree and Plant Protection	CD's; 12/06/2021
01 5713	Temporary Erosion and Sediment Control	CD's; 12/06/2021
01 6000	Product Requirements	CD's; 12/06/2021
01 6400	Owner Supplied Products	CD's; 12/06/2021
01 7419	Construction Waste Management and Disposal	CD's; 12/06/2021
	Construction Waste Mgmt and Disposal-Form A	CD's; 12/06/2021
	Construction Waste Mgmt and Disposal-Form A-Instructions	CD's; 12/06/2021
	Construction Waste Mgmt and Disposal-Form B	CD's; 12/06/2021
	Construction Waste Mgmt-Form B-Examples	CD's; 12/06/2021
01 7700	Closeout Procedures	CD's; 12/06/2021
01 8820	Impact Resistance Requirements	CD's; 12/06/2021
01 9113	General Commissioning Requirements	CD's; 12/06/2021
01 9113P	Air Terminal Unit	CD's; 12/06/2021

DIVISION 01 - GENERAL REQUIREMENTS

01 9113P	General Exhaust Fan Pre-Functional Checklist	CD's; 12/06/2021
01 9113P	Piping and Ductwork Pre-Functional Checklist	CD's; 12/06/2021
01 9113P	Rooftop Unit Pre-Functional Checklist	CD's; 12/06/2021
01 9113Q	Air Handling Unit Functional Performance Test	CD's; 12/06/2021
01 9113Q	Air Terminal Unit Heating and Cooling Functional Performance Test	CD's; 12/06/2021
01 9113Q	BAS Graphics Programmers' Guide	CD's; 12/06/2021
01 9113Q	General Exhaust Fan Functional Performance Test	CD's; 12/06/2021
01 9113Q	Isolation Room Functional Performance Test	CD's; 12/06/2021
01 9113Q	VAV Trend Data	CD's; 12/06/2021

DIVISION 2 - EXISTING CONDITIONS

02 4119	Selective Demolition	CD's; 12/06/2021

DIVISION 3 – CONCRETE

03 1000	Concrete Formwork	CD's; 12/06/2021
03 2000	Concrete Reinforcement	CD's; 12/06/2021
03 3000	Cast-in-Place Concrete	CD's; 12/06/2021
03 5400	Cast Underlayment	CD's; 12/06/2021
03 6200	Non-Shrink Grout	CD's; 12/06/2021

DIVISION 4 – MASONRY

04 2200	Concrete Unit Masonry	CD's; 12/06/2021

DIVISION 5 – METALS

05 1200	Structural Steel	CD's; 12/06/2021
05 3000	Steel Decking	CD's; 12/06/2021
05 4000	Cold-Formed Metal Framing	CD's; 12/06/2021
05 5000	Metal Fabrications	CD's; 12/06/2021
05 5213	Pipe and Tube Railings	CD's; 12/06/2021

DIVISION 6 - WOOD, PLASTICS, AND COMPOSITES

06 1053	Miscellaneous Rough Carpentry	CD's; 12/06/2021
06 1643	Gypsum Sheathing	CD's; 12/06/2021

DIVISION 6 - WOOD, PLASTICS, AND COMPOSITES

06 4020	Casework Hardware and Accessories	CD's; 12/06/2021
06 6450	Solid Surfacing Fabrications	CD's; 12/06/2021

DIVISION 7 - THERMAL AND MOISTURE PROTECTIONS

07 2116	Thermal Batt Insulation	CD's; 12/06/2021
07 2419	HCA - Water Drainage EIFS System	CD's; 12/06/2021
07 7100	Roof Specialties	CD's; 12/06/2021
07 8400	Firestopping	CD's; 12/06/2021
07 9200	Joint Sealants	CD's; 12/06/2021

DIVISION 8 – OPENINGS

08 1113	Hollow Metal Doors and Frames	CD's; 12/06/2021
08 1423	Laminate-Faced Flushed Wood Doors	CD's; 12/06/2021
08 3100	Access Doors and Panels	CD's; 12/06/2021
08 4313	Aluminum-Framed Storefronts	CD's; 12/06/2021
08 5013	Glazed Integral Blind Units	CD's; 12/06/2021
08 7100	Door Hardware and Door Index	CD's; 12/06/2021
08 8000	Glazing	CD's; 12/06/2021
08 8300	Mirrors	CD's; 12/06/2021

DIVISION 9 – FINISHES

09 2216	Non-Structural Metal Framing	CD's; 12/06/2021
09 2400	Cement Plastering	CD's; 12/06/2021
09 2900	Gypsum Board	CD's; 12/06/2021
09 3000	Tiling	CD's; 12/06/2021
09 5113	Acoustical Panel Ceilings	CD's; 12/06/2021
09 6513	Resilient Base and Accessories	CD's; 12/06/2021
09 6516	Resilient Sheet Flooring	CD's; 12/06/2021
09 6519	Resilient Tile Flooring	CD's; 12/06/2021
09 6813	Tile Carpeting	CD's; 12/06/2021
09 9100	Paints and Coatings (Sherwin-Williams)	CD's; 12/06/2021

DIVISION 10 – SPECIALTIES

10 1400	Graphics	CD's; 12/06/2021
10 2113.15	Stainless-Steel Toilet Compartments	CD's; 12/06/2021
10 2116.01	HCA-Solid Surface Showers and Vanities	CD's; 12/06/2021
10 2213	Wire Mesh Partitions	CD's; 12/06/2021
10 2239	Folding Panel Partitions	CD's; 12/06/2021
10 2600	HCA-Wall Protection	CD's; 12/06/2021
10 2800	Toilet and Bath Accessories	CD's; 12/06/2021
10 7316	Aluminum Canopies	CD's; 12/06/2021

DIVISION 11 – EQUIPMENT

11 1313	Loading Dock Bumpers	CD's; 12/06/2021
11 1319	Stationary Loading Dock Equipment	CD's; 12/06/2021

DIVISION 12 – FURNISHINGS

12 2400	HCA-Window Shades	CD's; 12/06/2021
12 3216	HCA-Manufactured Plastic-Laminate Face Casework	CD's; 12/06/2021
12 3623.13	HCA-Plastic Laminate-Clad Countertops	CD's; 12/06/2021
12 3661	HCA-Simulated Stone Countertops	CD's; 12/06/2021

DIVISION 13 – SPECIAL CONSTRUCTION

13 3419	Metal Building Systems	CD's; 12/06/2021

DIVISION 21 - FIRE SUPPRESSION

21 0500	Common Work Results for Fire Suppression	CD's; 12/06/2021
21 1000	Water Based Fire Suppression Systems	CD's; 12/06/2021
21 1000A	Flow Test	CD's; 12/06/2021
21 1000B	Hydraulic Calculations First Floor Ancillary Building	CD's; 12/06/2021
21 1000C	Hydraulic Calculations Loading Dock	CD's; 12/06/2021

DIVISION 22 - PLUMBING

22 0500	Common Work Results for Plumbing	CD's; 12/06/2021
22 0719	Plumbing Insulation	CD's; 12/06/2021
22 1116	Domestic Water Piping	CD's; 12/06/2021

DIVISION 22 - PLUMBING

22 1119	Domestic Water Piping Specialties	CD's; 12/06/2021
22 1123	Domestic Water Pumps	CD's; 12/06/2021
22 1316	Sanitary Waste and Vent Piping	CD's; 12/06/2021
22 1319	Sanitary Waste Piping Specialties	CD's; 12/06/2021
22 1400	Storm Drainage	CD's; 12/06/2021
22 3300	Electric Domestic Water Heaters	CD's; 12/06/2021
22 4300	Plumbing Fixtures	CD's; 12/06/2021
22 4500	Emergency Plumbing Fixtures	CD's; 12/06/2021
22 4700	Drinking Fountains and Water Coolers	CD's; 12/06/2021
22 6013	Medical Gas Piping System	CD's; 12/06/2021

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

23 0170	Equipment Sound Power Levels	CD's; 12/06/2021
23 0500	Common Work Results for HVAC	CD's; 12/06/2021
23 0513	Electric Motors	CD's; 12/06/2021
23 0549	Basic Materials and Methods for HVAC	CD's; 12/06/2021
23 0593	Testing, Adjusting and Balancing	CD's; 12/06/2021
23 0710	Insulation	CD's; 12/06/2021
23 0923	Direct Digital Control Building Automation System DDC BAS	CD's; 12/06/2021
23 2300	Refrigerant Piping System	CD's; 12/06/2021
23 3110	Sheet Metal Ductwork – Low Pressure	CD's; 12/06/2021
23 3111	Sheet Metal Ductwork – Medium Pressure	CD's; 12/06/2021
23 3300	Air Duct Accessories	CD's; 12/06/2021
23 3400	Centrifugal Fans	CD's; 12/06/2021
23 3600	Air Terminal Units	CD's; 12/06/2021
23 4000	HVAC Air Cleaning Devices	CD's; 12/06/2021
23 8143	Air-cooled Split System Heat Pump	CD's; 12/06/2021
23 8240	Electric Heaters	CD's; 12/06/2021

DIVISION 26 - ELECTRICAL

26 0500	Common Work Results for Electrical	CD's; 12/06/2021
26 0519	Low-Voltage Electrical Power Conductors and Cables – 600 Volts and Below	CD's; 12/06/2021
26 0526	Grounding and Bonding for Electrical Systems	CD's; 12/06/2021

DIVISION 26 - ELECTRICAL

26 0529	Hangers and Supports for Electrical Systems	CD's; 12/06/2021
26 0533	Raceway and Conduit Systems	CD's; 12/06/2021
26 0573	Power System Analysis	CD's; 12/06/2021
26 0913	Energy and Resource Metering	CD's; 12/06/2021
26 1219	Low Voltage Electric Service Entrance	CD's; 12/06/2021
26 2200	Low-Voltage Transformers	CD's; 12/06/2021
26 2416	Panelboards	CD's; 12/06/2021
26 2726	Wiring Devices	CD's; 12/06/2021
26 2816	Enclosed Switches and Circuit Breakers	CD's; 12/06/2021
26 2913	Enclosed Controllers	CD's; 12/06/2021
26 2923	Variable Frequency Motor Controller	CD's; 12/06/2021
26 4113	Lightning Protection for Structures	CD's; 12/06/2021
26 4313	Transient-Voltage Surge Suppression (TVSS)	CD's; 12/06/2021
26 5100	Interior Lighting	CD's; 12/06/2021
26 5600	Exterior Lighting	CD's; 12/06/2021
26 7000	Connection to Owner Furnished Equipment	CD's; 12/06/2021

DIVISION 27 - COMMUNICATIONS

27 0526	Grounding and Bonding for Communications	CD's; 12/06/2021
27 1500	Structured Voice and Data Cabling	CD's; 12/06/2021
27 3700	Low Voltage Rough-In Specifications	CD's; 12/06/2021
27 5101	Television Cable System	CD's; 12/06/2021
27 5116	Overhead Paging Speaker System	CD's; 12/06/2021

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 2300	Closed Circuit TV (CCTV)	CD's; 12/06/2021
28 3100	Fire Detection and Alarm	CD's; 12/06/2021

DIVISION 31 - EARTHWORK

31 1000	Site Clearing	CD's; 12/06/2021
31 2000	Earth Moving	CD's; 12/06/2021
31 2310	Excavating, Backfilling, Compacting	CD's; 12/06/2021

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 1216	Asphalt Paving	CD's; 12/06/2021
32 1313	Concrete Paving	CD's; 12/06/2021
32 1314	Concrete Sidewalk	CD's; 12/06/2021
32 1373	Concrete Paving Joint Sealants	CD's; 12/06/2021
32 1723	Pavement Markings	CD's; 12/06/2021
32 8400	Irrigation	CD's; 12/06/2021
32 9200	Turf and Grasses	CD's; 12/06/2021
32 9300	Plants, Shrubs and Groundcovers	CD's; 12/06/2021

DIVISION 33 – UTILITIES

33 0500	Common Work Results for Utilities	CD's; 12/06/2021
33 4100	Storm Utility Drainage Piping	CD's; 12/06/2021

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/6/2021

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END OF SECTION

**SECTION 00 2150
HCA PREFERRED VENDORS AND MANUFACTURERS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The following list identifies manufacturers and vendors preferred by the Owner, for involvement in its many construction projects. This list may or may not preclude involvement by other companies.
- B. HCA has a relationship with HealthTrust Purchasing Group (HPG) and wishes to receive quotes from their contracted vendors. The list includes the latest available information regarding HPG contracts. These contracts should be utilized regarding HPG specific pricing and contract terms, Projects that contain products in specification sections where an HPG contracted vendor is available, the HPG contract vendor must be contacted to provide a quote for the Project. Not all manufacturers and vendors preferred by HCA participate with HPG and their purchasing agreements.
- C. Not all manufacturers or distributors identified provide materials intended or expected to be used on this Project and interested individuals must refer to individual technical specification sections of this Project Manual for those elements appropriate to this Project.
- D. Manufacturers identified in this list but not specifically identified in the technical specifications, if willing and capable to provide materials meeting the stated criteria, may be presented by the Contractor for considerations as Alternates.

1.2 LIST

- A. The HCA Preferred Vendor List begins on the following page.
- B. The HPG suppliers and manufacturers with negotiated purchasing agreement numbers are identified in the list.

1.3 DEFINITIONS

- A. Sole Source (no substitutions) – This is the only product/manufacture that can be used. This precludes involvement by other companies to bid and receive awards.
- B. Multi-source (no substitutions) – There are multiple products/manufacturers that can be used, which are all identified on the list. This precludes involvement by other companies to bid and receive awards.
- C. Preferred Vendor – The manufacturer shall be allowed to provide a bid price for the Project. This does not preclude involvement by other companies to bid and receive awards.

END OF SECTION

HCA Healthcare Capital Deployment Preferred Vendors		Last Update: Sept. 2021
Designation	Description	
Sole Source (no substitutions)	This is the only product / manufacturer that can be used. This precludes involvement by other companies to bid and receive awards.	
Multi Source (no substitutions)	There are multiple products / manufacturers that can be used, which are all identified on the list. This precludes involvement by other companies to bid and receive awards.	
Preferred vendor	While not a negotiated contract, the manufacturer has preferred status and shall be allowed to provide a bid price for the job. This does not preclude involvement by other companies to bid and receive awards.	
NA	Not applicable to work / scope preformed internally	

Contract Category	Supplier	HPG Contract Nu	Contact Information	HCA Designation
Division 03 - Concrete				
Gypsum Concrete Underlayment	Ardex			Multi source
	Mapei			Multi source
Division 06 - Wood, Plastics and Composites				
Sheathing	USG			Preferred
	Georgia Pacific			Preferred
Division 07 - Thermal and Moisture Protection				
Exterior Insulation and Finish System (EIFS)	Dryvit			Multi source
	Sto		Mike Gracey (Primary) mgracey@stocorp.com Phone: 404-973-9249 Tim Salerno (StoPanel Division) tsalerno@stocorp.com Phone: 407-466-5371	Multi source
Slab-On-Grade Vapor Retarder	Ardex			Multi source
	Concure			Multi source
	Koester			Multi source
	Stauf			Multi source
	WR Grace			Multi source
	Tremco	5768	Casey Chandler cchandler@tremcoinc.com Phone 704-575-7613	Multi source
EPDM	Carlisle - Syntec			Multi source
	Centimark	5781	Wayne Barr wayne.barr@centimark.com Phone: 615-991-9223	Multi source
	Firestone	55355	Matt Traverse traversematt@bfusa.com (615) 937-5152	Multi source
	Genflex			Multi source
	J. Reynolds & Company	5641	Matt Skipper mskipper@jreynolds.com Phone 817-306-9596	Multi source
	Tremco	5768	Casey Chandler cchandler@tremcoinc.com Phone 704-575-7613	Multi source
Thermoplastic Polyolefin (TPO) Roofing	Carlisle - Syntec			Multi source
	Centimark	5781	Wayne Barr wayne.barr@centimark.com Phone: 615-991-9223	Multi source
	FiberTite			Multi source
	Firestone	55355	Matt Traverse traversematt@bfusa.com (615) 937-5152	Multi source
	Genflex			Multi source
	J. Reynolds & Company	5641	Matt Skipper mskipper@jreynolds.com Phone 817-306-9596	Multi source
	Sarnafil	18262	Bill Love love.bill@us.sika.com Phone: 586-201-0431	Multi source
	Tremco	5768	Casey Chandler cchandler@tremcoinc.com Phone 704-575-7613	Multi source
Modified Bitumen	Centimark	5781	Wayne Barr wayne.barr@centimark.com Phone: 615-991-9223	Multi source
	Firestone	55355	Matt Traverse traversematt@bfusa.com (615) 937-5152	Multi source
	J. Reynolds & Company	5641	Matt Skipper mskipper@jreynolds.com Phone 817-306-9596	Multi source
	Johns Manville	15419	Eric Smith eric.smith@jm.com 916-230-1536	Multi source
	Siplast			Multi source
	Soprema	12456	Eric Younkin eyounkin@soprema.us 330-334-0066 ext. 2228	Multi source
	Tremco	5768	Casey Chandler cchandler@tremcoinc.com Phone 704-575-7613	Multi source
	WP Hickman			Multi source

HCA Healthcare Capital Deployment Preferred Vendors				Last Update: Sept. 2021
Sheet Metal Roofing	Centimark	5781	Wayne Barr wayne.barr@centimark.com Phone: 615-991-9223	Multi source
	J. Reynolds & Company	5641	Matt Skipper mskipper@jreynolds.com Phone 817-306-9596	Multi source
	Tremco	5768	Casey Chandler cchandler@tremcoinc.com Phone 704-575-7613	Multi source
Thermal Insulation	Owens Corning			Preferred
Applied Fireproofing	WR Grace			Multi source
	CAFO			Multi source
	Isolatek			Multi source
Penetrating Firestopping	WR Grace			Multi source
	3M			Multi source
	STI			Multi source
	Hilti			Multi source
	Multiple Manufacturers	148	Mike Harrod WW Grainger, Inc. mike.harrod@grainger.com phone: 502-655-0258	Multi source
Joint Sealants	Sherwin Williams	5893	Patrick Noble patrick.t.noble@sherwin.com Phone 216-515-7925	Multi source
	Koroseal			Multi source
	Tremco	5768	Casey Chandler cchandler@tremcoinc.com Phone 704-575-7613	Multi source
Division 08 - Doors and Windows				
Wood Doors	VT		Buzz Jacoway VT Doors bjacoway@netzero.net 615-400-0236	Preferred
Metal Doors and frames	Steelcraft	7702	Gene Jones SSC South / Allegion gene.jones@allegion.com phone: 615-631-8650	Sole Source
	Republic			
Mechanical lock	Schlage	7702	Gene Jones SSC South / Allegion gene.jones@allegion.com phone: 615-631-8650	Sole Source
	Falcon			
Door closers	LCN	7702	Gene Jones SSC South / Allegion gene.jones@allegion.com phone: 615-631-8650	Sole Source
	Falcon			
Exit Devices	Von Duprin	7702	Gene Jones SSC South / Allegion gene.jones@allegion.com phone: 615-631-8650	Sole Source
	Falcon			
Accessories	IVES	7702	Gene Jones SSC South / Allegion gene.jones@allegion.com phone: 615-631-8650	Sole Source
	Glenn-Johnson			
	Falcon			
Sliding Glass ICU/CCU Doors	Besam			Multi source
Automatic Door Operators	Stanley			Multi source
Division 09 - Finishes				
Gypsum Board Assemblies	USG			Preferred
	Georgia Pacific			Preferred
Resilient Flooring	Mannington	5468	Terri Bailey HCA@mannington.com Phone: 615-427-8980	Sole Source
Resinous Flooring				
Carpeting	Shaw	500169	Deborah Smith deborah.smith@shawinc.com 704-249-6758	Multi source
	Tandus	500148	James Bourgeois james.bourgeois@tarkett.com 225-205-4519	Multi source
	Masland	6573	Jeff Taylor jeff.taylor@maslandcontract.com Phone: 404-543-7167	Multi source
	Mannington	5468	Terri Bailey HCA@mannington.com Phone: 615-427-8980	Multi source
Tile	Crossville Ceramics			Multi source
	Daltile Corporation			Multi source
	Louisville Tile (Crossville Ceramics)			Multi source
	Royal Mosa			Multi source
	Stonepeak Ceramics, Inc.			Multi source

HCA Healthcare Capital Deployment Peferred Vendors				Last Update: Sept. 2021
Base	Mannington	5468	Terri Bailey HCA@mannington.com Phone: 615-427-8980	Sole Source
Paint and coatings	Sherwin Williams	5893	Patrick Noble patrick.t.noble@sherwin.com Phone 216-515-7925	Multi source
Wallcovering	Eykon			Multi source
	DesignTex Inc. (includes J.M. Lynne and Essex)		Available through contract furniture dealers	Multi source
	Koroseal Interior Products			Multi source
	MDC Wallcoverings		Available through contract furniture dealers	Multi source
	National Wallcovering		Available through contract furniture dealers	Multi source
	Maharam		Available through contract furniture dealers	Multi source
	Sherwin Williams	5893	Patrick Noble patrick.t.noble@sherwin.com Phone 216-515-7925	Multi source
Wall Protection	InPro Corporation	44661	Julie Mooney 679-9010 ext. 5254 jmooney@inpro.com	262- Sole Source
Solid Surface	Avonite			Multi source
	Corian			Multi source
	Formica			Multi source
	Wilsonart International, Inc.			Multi source
Acoustic Ceilings	Armstrong World Industries	6924	Anna Justice HCA@armstrong.com Phone: 717-396-4325	Sole source
Plastic Laminate	Formica			Multi source
	Panola Industries - Nevamar			Multi source
	Panola Industries – Pionite			Multi source
	Wilsonart International, Inc.			Multi source
Division 10 - Specialties				
Marker Boards	Claridge		Matt Green Matt@chameleonwhiteboard.com	Multi source
			615.656.3280 ext 1	
	Eagan Visual		Available through contract furniture dealers	Multi source
	G&T Industries			Multi source
	Staples Advantage	2532	Deb Mailmstrom deb.malmstrom@staples.com Phone: 770-532-8033	Multi source
	Peter Pepper		Available through contract furniture dealers	Multi source
Solid Surface Shower System	InPro Corporation	44661	Mike O'Connell Inpro Corporation moconnell@inprocorp.com Phone: 608-640-8196	Sole Source
Lockers	Quantum Medical	5522	Elizabeth Faller elizabethf@quantumstorage.com 15800 NW 15th Ave Miami, FL 33169	Multi source
	Storage Systems	500166	Bill Kreager bkreager@storagesystems.com Phone: 888-614-0004	Multi source
Division 11 - Equipment				
Food Service Equipment	Inman Foodservices Group	7227	Billy Inman billy.inman@inman-inc.com 3807 Charlotte Ave, Nashville TN 37209 Phone: 615-812-6500	Multi source
Division 12 - Furnishings				
Ice Machines	Follett Corporation	5000041	Gary Gutman ggutman@follettice.com 800-523-9361	Multi source
Audio-Visual Equipment (TVs, Accessories)	Grainger	4077	Todd Dietrich todd.dierich@grainger.com 314-368-8659	Multi source
	Remar	3248	Kevin Kolff kkolff@remarinc.com 615-449-0231	Multi source
	Telehealth	500045	Darrell Leftwich darrell.leftwich@telehealth.com 615-383-7836	Multi source
Division 13 - Special Construction				
Division 14 - Conveying Systems				
Elevators	Schindler	7257	Daniel Winder daniel.winder@schindler.com 972-358-5063	Multi source
	Otis	4229	Ernie Dominguez Ernie.Dominguez@otis.com 567-7840	512- Multi source

HCA Healthcare Capital Deployment Preferred Vendors				Last Update: Sept. 2021
	Kone	6008	Dean Enrico dean.enrico@kone.com 770-527-1163	Multi source
Pneumatic Tube System	Pevco	31267	James Valerino 961-3050 jvalerino@pevco.com	410-Preferred
	Swisslog			Preferred
Division 21 - Fire Suppression & Detection				
Division 22 - Plumbing				
Domestic Water Piping and Valves	Mueller	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Borzan			
	Dura-Line			
	Uponor			
	Nibco			
	Milwaukee			
	B-Line			
	FNW			
	Conbraco			
	Anvil			
	Ipsco			
	Victaulic			
Domestic Water Backflow Preventers, Trap Primers, and Shock Absorbers	Zurn/Wilkins	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Proflo			
	PPP			
	Sioux Chief			
	Watts			
Domestic Water Pumps	Taco			Multi source
	Systecon			Multi source
	Bell & Gossett			Multi source
	SyncroFlo			Multi source
	Canariis			Multi source
	Grundfos			Multi source
Domestic Waste Piping and Drains	Charlotte	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Tyler Pipe			
	ABI			
	Ideal			
	Proflo			
	Zurn			
Mechanical Piping	Ipsco	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Borzan			
	Aquatherm			
	Weldbend			
	Milwaukee			
	Nordstrom			
	B-Line			
	FNW			
	Nibco			
	Anvil			
General Service Compressed Air Piping and Valves	Beacon Medeas			Multi source
	Allied Health Products			Multi source
	Amico			Multi source
	Powrex			Multi source
Commercial Domestic Water Softeners	Culligan			Multi source
	Anderson Chemical			Multi source
	Bruner			Multi source
	Hydromax			Multi source
	Stay-rite			Multi source
	Marlo			Multi source
	Garratt-Callahan Company	3968	John Reseland ireseland@g-c.com 412-721-5292	Multi source
	Wigan			Multi source
	Nalco	3923	Lawrence Gess lgess@nalco.com 630-305-1658	Multi source
Commercial Storage Electric Domestic Water Heaters	Hesco			Multi source
	Ruud			Multi source
	State			Multi source
	Bradford White			Multi source
	AO Smith			Multi source
	PVI			Multi source
Commercial, Atmospheric, Gas Domestic Water Heaters	Lochinvar			Multi source
	Aerco			Multi source
	Hesco			Multi source
	Bradford White			Multi source
	Patterson Kelly			Multi source
	Teledyne Laars			Multi source
	PVI			Multi source
	AO Smith			Multi source

HCA Healthcare Capital Deployment Preferred Vendors				Last Update: Sept. 2021
Commercial, Power-Vent, Gas Domestic Water Heaters	Aerco			Multi source
	Hesco			Multi source
	Patterson Kelly			Multi source
	Armstrong			Multi source
Plumbing Fixtures and Drinking Fountains	Symmons	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Zurn			
	Elkay			
Medical Gas Piping System	Elkhart	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Mueller			
	Nibco			
Deionized Water Piping		5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Enfield			
	Orion			
Division 23 - Heating, Ventilation and Air Conditioning (HVAC)				
Electric Motors	MagneTek			Multi source
	Lincoln			Multi source
	Marathon			Multi source
	Gould			Multi source
	Toshiba			Multi source
	Baldor			Multi source
	Reliance			Multi source
	US Motors			Multi source
	General Electric			Multi source
Vibration Isolation	Mason Industries			Multi source
	kinetics Noise Control			Multi source
	Vibration Eliminator			Multi source
	Korfund			Multi source
	Amber Booth			Multi source
Building Automation System	Johnson Controls	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Multi source
	Siemens	3574	Ed Tambornino ed.tambornino@siemens.com Phone: 615-329-2601	Multi source
	Schneider Electric		Jeffrey Eggleston jeff.eggleston@schneider-electric.com 469-995-1092	Multi source
Fuel Oil Storage and Handling System	Xerexes			Multi source
	Owens Corning			Multi source
Fuel Oil Leak Detection and Alarm System	Enterprise Brass			Multi source
	Veeder-Root			Multi source
	Pollulert			Multi source
HVAC Pumps	PetroVend			Multi source
	Peerless			Multi source
	Armstrong			Multi source
	Bell & Gossett	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Multi source
	Aurora			Multi source
	Paco			Multi source
	Taco			Multi source
	Grundfos			Multi source
	Weinman			Multi source
Steam and Condensate Heating Piping	Ipsco			
	Borzan			
	Aquatherm			
	B-Line			
	FNW	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Sole Source
	Milwaukee			
	Weiss			
	Sarco			
	Weldbend			
Sound Alternators	Nibco			
	Anvil			
	McGill			Multi source
	IAC			Multi source
	Vibro-Acoustics			Multi source
Variable Air Volume (VAV) units	Johnson Controls	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Multi source
	Siemens	3574	Ed Tambornino ed.tambornino@siemens.com Phone: 615-329-2601	Multi source

HCA Healthcare Capital Deployment Preferred Vendors				Last Update: Sept. 2021
Air Filters	American Air Filter			Multi source
	CamFil	6688	David Blackwell 806-773-8408 Dave.Blackwell@camfil.com	Multi source
	TriDim	6686	Tabatha Henshaw 540-967-5789 t.henshaw@tridim.com	Multi source
	Kock	No longer contracted	Regina McAnaly reginam@kochfilter.com 502-634-6204	Multi source
	Clarcor	6718	Chuck Lehman clehman@clclair.com 502-810-5764	Multi source
Prefabricated Gas Vent System	American Metal Products			Multi source
	Metal-fab			Multi source
	Selkirk			Multi source
	Metalbestos			Multi source
Fire Tube Boilers	Burnham			Multi source
	Cleaver Brooks			Multi source
	Superior Boiler			Multi source
	Industrial Combustion			Multi source
	Lochinvar			Multi source
	Bryan			Multi source
	Aerco			Multi source
	Hurst			Multi source
	Weil-McLane	5999	Bettina Dawson Ferguson Enterprises bettina.dawson@ferguson.com Phone: 615-316-1920	Multi source
Deaerator	Cleaver Brooks			Multi source
	Chicago Heater			Multi source
	Crane Cochrane			Multi source
	Industrial Steam			Multi source
Air-Cooled Condensing Units	Carrier	6741		Multi source
	Trane	3572	Brian Bolin brian.bolin@Trane.com Phone: 615-584-9391	Multi source
	McQuay	3574	Mark Kearschner mark.kearschner@daikinmcquay.com Phone: 704-340-1520	Multi source
	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Multi source
Centrifugal Water Chiller	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Sole source
Packaged Air Cooled Chiller	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Sole source
Packaged Air Cooled Chiller for MRI	Filtrine			Multi source
	KKT			Multi source
	Kraus			Multi source
	Neslab			Multi source
Cooling Tower	Baltimore Air Coil			Multi source
	Evapco			Multi source
	Marley			Multi source
Air-Handling Unit - Medium Or Low Pressure	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Sole source
Rooftop Air Handling Unit	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Sole source
Packaged Rooftop Unit	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Sole source
Computer Room Air-Conditioning Unit	Liebert			Multi source
	Airedale			Multi source
	HiRoss			Multi source
	DataAire			Multi source
	Compu-Aire			Multi source
	Schneider			Multi source
	Stultz			Multi source
Split System A/C Units	Carrier	6741	Justin Leslie 318-5139 Justin.leslie@carrier.com	352-Multi source
	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740	Multi source
	McQuay	3574	Mark Kearschner mark.kearschner@daikinmcquay.com Phone: 704-340-1520	Multi source
	Trane	3572	Brian Bolin brian.bolin@Trane.com Phone: 615-584-9391	Multi source

HCA Healthcare Capital Deployment Preferred Vendors					Last Update: Sept. 2021
Duct Heaters	Carrier	6741	Justin Leslie 318-5139 Justin.leslie@carrier.com	352-	Multi source
	McQuay	3574	Mark Kearschner mark.kearschner@daikinmcquay.com Phone: 704-340-1520		Multi source
	Trane	3572	Brian Bolin brian.bolin@Trane.com Phone: 615-584-9391		Multi source
	York/JCI	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740		Multi source
Humidifiers	Armstrong				Multi source
	Hermidifier				Multi source
	Dristream				Multi source
	Pure Stream				Multi source
	Nortec				Multi source
Division 26 - Electrical					
Pad-Mounted Transformers	Square D	5892	Graybar – Nashville Jess Hoover, Charlie Shannon HCA@graybar.com 239-494-2088, 615-743-3226		Multi source
	Cutler-Hammer / Westinghouse	6448	Consolidated Electrical Distributors (CED) Lance Smith HCA@ced-nashville.com 615-329-2601		Multi source
Generator Synchronizing Switchgear	ASCO	7228	Perry Kaiser 966-2131 perry.kaiser@ascopower.com	973-	Multi source
	Cummins Crosspoint	6344	Chris Banet HCA@cummins.com Phone: 615-478-2057		Multi source
Circuit Breaker Distribution Switchboards	Culter Hammer	6448	Consolidated Electrical Distributors (CED) Lance Smith HCA@ced-nashville.com 615-329-2601		Multi source
	Square D	5892	Graybar – Nashville Jess Hoover, Charlie Shannon HCA@graybar.com 239-494-2088, 615-743-3226		Multi source
Safety Switches	Culter Hammer				Multi source
	Square D				Multi source
Emergency Standby Engine Generator System	Cummins Crosspoint	6344	Chris Banet HCA@cummins.com Phone: 615-478-2057		Multi source
	Caterpillar	46261	Steve Turner HealthTrust@cat.com Phone: 309-494-5105		Multi source
	Kohler	66551	Keith Kraemer hcasales@nixonpower.com Phone: 615-664-1487		Multi source
	Energy Systems Southeast	3489	Mike Evans HCA@essellc.com Phone: 865-806-9435		Multi source
Surge Protective Devices	Eaton / Cutler Hammer	6448	Consolidated Electrical Distributors (CED) Lance Smith HCA@ced-nashville.com 615-329-2601		Multi source
	Square D	5892	Graybar – Nashville Jess Hoover, Charlie Shannon HCA@graybar.com 239-494-2088, 615-743-3226		Multi source
Modular Headwall Units	BLOX		Amanda Moore amoore@bloxbuilt.com 205-424-3242		Multi source
	Neopod		Michael Miller mmiller@neopodsystems.com 512-987-0097		Multi source
Lighting	Acuity	5892	Graybar – Nashville Jess Hoover, Charlie Shannon HCA@graybar.com 239-494-2088, 615-743-3226		Multi Source
	Cooper Lighting	6448	Consolidated Electrical Distributors (CED) Caitlin James HCA@ced-nashville.com Cell - 901-488-0188 Office - 615-329-2601		Multi source
Fire & Life Safety Systems	Johnson Control	3273	Kevin Tolbert BE-HCA@jci.com 478-952-8740		Multi source
	Siemens	3574	Ed Tambornino ed.tambornino@siemens.com Phone: 615-329-2601		Multi source
	Edwards				Multi source

HCA Healthcare Capital Deployment Preferred Vendors				Last Update: Sept. 2021
Structured Voice and Data Cabling Infrastructure	Accu-Tech	6715	Tim Flannagan 615-430-0813 Tim.Flannagan@accu-tech.com	Multi source
		5892	Graybar – Nashville Jess Hoover, Charlie Shannon HCA@graybar.com 239-494-2088, 615-743-3226	Multi Source
Division 28 - Electronic Safety and Security				
Security System	ADT			Multi source
	Stanley			Multi source
Access Controls	Lenel Systems International, Inc.		Rick Keebler richard.keebler@lenel.com 513-260-1140	Multi source
	Software House / Tyco International		Keg Giles kgiles@tycoint.com 770-595-4719	Multi source
	aptiQ	7702	Gene Jones SSC South / Allegion gene.jones@allegion.com 615-631-8650	Multi source

Project Manual For:



Lake City Medical Center
Ancillary Building
340 NW Commerce Drive
Lake City, Florida

Construction Documents

December 6, 2021

Architect Project # 45057.00
HCA Project # 3793800011



Architecture

Gresham Smith
Nashville, Tennessee, 37201
Phone # 615-770-8100
FL Qualifier No. AR0013420
FL Registry No. RY3806
Principal: Rob Hamby
Architect/Interior Designer of Record: Eric Snyder
Project Architect: Eric Snyder
Project Coordinator: Traci Myers
Interior Designer: Morgan Black



Structural Engineering

Stanley D. Lindsey & Associates, Ltd
Nashville, Tennessee, 37027
Phone # 615-320-1735
FL Qualifier No. 39200
FL Registry No. 1329
Project Principal/Engineer: Mark Hilner
Structural Engineer of Record: Michael E. Corrin

M, P & E Engineering

I.C. Thomasson Associates, Inc.
Nashville, Tennessee, 37204
Phone # 615-346-3400
FL Qualifier No. 38970
FL Registry No. 1276
Principal: Josh Cartwright
Project Manager: Paul C. McKinney
Mechanical Engineer of Record: Shawn Sullivan
Plumbing Designer: Donna Seigal
Electrical Engineering: Paul C. McKinney
Telecom: Michael Henry

Civil & Landscape

Kimley-Horn
2615 Centennial Blvd., Suite 102
Tallahassee, Florida 32308
Phone# 850-553-3500
FL Qualifier No.
FL Registry No. 696
Project Manager: Chris Akers
Landscape Architect: Charlie Johnson
Civil Engineer of Record: Kelsey Lewis, P.E.

HCA Vendor Information

Artwork:

Ambiance
Adrienne Graham
615-353-0723

Furniture:

OFS
Candice Manring
800-763-0212

Monitoring/Telemetry:

GE
Tarey Isbell: 901-451-7496
Joseph West: 770-710-2731

Shelving, Bins, Carts:

Storage Systems
Charles Spann: 615-468-1236

Textiles:

Phoenix Textile
Scott Rodgers: 800-325-1440

HCA Design Manager:

Nicole Hoch
Nicole.Hoch@HCAHealthcare.com

HCA Construction Manager:

Ben McAlpin
Ben.McAlpin@HCAHealthcare.com

**SECTION 01 1000
SUMMARY OF WORK**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Contract description.
 - 2. Owner-supplied products.
 - 3. Contractor's use of Site .
 - 4. Work sequence.
 - 5. Owner occupancy.
 - 6. Permits.
 - 7. Specification conventions.
- B. Related Requirements:
 - 1. Section 01 5000 Temporary Facilities and Controls for limitations and procedures governing temporary use of Owner's facilities.

1.2 CONTRACT DESCRIPTION

- A. Work of the Project includes construction and build-out of a 13,800 square foot prefabricated metal building.
- B. Project Location: Lake City Medical Center, 340 NW Commerce Drive, Lake City, Florida 32055.
- C. Perform Work of Contract under HCA Contract with Owner according to Conditions of Contract.

1.3 OWNER CONSULTANTS

- A. The Owner has retained certain design professionals who have prepared designated portions of the Contract Documents. Such portions do not have the indicia of the Engineer.
- B. The Engineer is responsible only for Contract Documents prepared by the Engineer and its consultants and for administration of the contract for construction only for those portions of the Work designed by the Engineer and its consultants.

1.4 OWNER-SUPPLIED PRODUCTS

- A. Owner Responsibilities:
 - 1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples to Contractor.
 - 2. Arrange and pay for delivery of owner supplied products to Site.
 - 3. Upon delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor Responsibilities:
 - 1. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
 - 2. Receive and unload owner supplied products at Site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install, and finish products.
 - 4. Repair or replace items damaged after receipt.

1.5 CONTRACTOR'S USE OF SITE

- A. Limit use of Site and premises to allow:
 - 1. Owner occupancy. Owner staff regular work hours are 7 am to 6 pm, EST..
 - 2. Do not unreasonably encumber site with equipment, materials, or vehicles.

3. Parking for construction personnel including the use of Owner's parking lot(s) shall be reviewed with the Owner before construction start.
- B. Access to Site: Limited to areas as designated by the Owner.
- C. Emergency Building Exits during Construction: Maintain all emergency paths during the duration of the Work. Coordinate with the Owner any disruption to the building means of exit egress.
- D. Construction Operations: Limited to areas indicated on Drawings.
 1. Noisy and Disruptive Operations (such as Blasting, Use of Jack Hammers and Other Noisy Equipment): Not allowed in close proximity to existing building during regular hours of operation. Coordinate and schedule such operations with Owner to minimize disruptions.
- E. General: Contractor shall have limited use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of the Project.
- F. Time Restrictions for Performing Exterior Work: As coordinated with the Owner.
- G. Utility Outages and Shutdown:
 1. Coordinate and schedule electrical and other utility outages with Owner.
 2. Outages: Allowed only at previously agreed upon times. <>.
 3. At least one week before scheduled outage, submit Outage Request Plan itemizing the dates, times, and duration of each requested outage
- H. Sound Level Restrictions: Sound pressure level measured at boundary of Site shall not exceed 40 dBA.
- I. Construction Plan: Before start of construction, submit three copies of construction plan regarding access to Work, use of Site, and utility outages for acceptance by Owner. After acceptance of plan, construction operations shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.6 WORK SEQUENCE

- A. Construct Work in phases in order to accommodate Owner's occupancy requirements during construction period. Coordinate construction schedule and operations with :
 1. Stage 1: <Relocate Helipad>.
 2. Stage 2: <Construct and build-out premanufactured metal building>.
- B. Sequencing of Construction Plan: Before start of construction, submit construction plan regarding phasing of demolition, < and new Work for acceptance by Owner. After acceptance of plan, construction sequencing shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.7 OWNER OCCUPANCY

- A. Schedule and substantially complete designated portions of the Work for occupancy before Substantial Completion of the entire Work.
 1. Owner's use and occupancy of designated areas before Substantial Completion of the entire Project do not relieve Contractor of responsibility to maintain specified insurance coverages on a 100 percent basis until date of final payment.
- B. Owner will occupy Site during entire period of construction. Phasing of construction for installation of underslab plumbing may be required. Coordinate Phasing with Owner.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

1.8 PERMITS

- A. Supply necessary permits for construction of Work including the following:
 - 1.
 - 2. Fire Sprinkler permit

1.9 SPECIFICATION CONVENTIONS

- A. Specifications are written in imperative mood and streamlined form. This imperative language is directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Owner Documents: Certain included in the Project Manual documents were prepared by the Owner. These documents were included in the Project Manual without modification by Gresham Smith and are not issued under the seals of the Engineer or its consultants.
 - 1. Some Owner Specification sections may include cross references to specification sections that are not being provided for this Project and do not apply to the Work of Contract.
 - 2. Send requests for Information relating to Owner documents directly to the Owner's designated Project representative with a copy to the Engineer. The Owner will respond to such RFIs.
 - 3. No provision in the Owner's documents shall be effective to change the duties and responsibilities of Gresham Smith from those stated in its Agreement with the Owner.
 - 4. Gresham Smith is not responsible for enforcing provisions of Owner documents relating to construction safety.

1.10 PROJECT INFORMATION EXCHANGE

- A. Project Information Exchange: The Engineer will provide access to relevant Project files through its project information management software Newforma without charge to Contractor and provide instruction on its use. This software includes the ability to exchange large files and large numbers of files.
 - 1. Contract Documents will be issued using this software.
 - 2. Contractor shall use this software for transmitting all files for contract administration documents; no other method is acceptable. The Engineer will not download documents from Contractor's FTP site.
 - 3. Additional requirements for specific types of contract administration documents are specified in other Division-01 Specifications sections.

PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

3.1 SEQUENCE OF WORK

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300 - Submittal Procedures: Submittal procedures, coordination
- B. Section 01 6000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.
- C. Individual product specification sections may have specific requirements

1.3 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- D. Limit each request to a single proposed substitution item.
 - 1. Submit an electronic document, combining the request form with supporting data into single document.

3.2 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.
- C. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.3 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.4 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.
- C.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 2501.01
SUBSTITUTION REQUEST FORM**

THIS FORM IS FOR CONTRACTOR'S REQUESTS FOR SUBSTITUTIONS AFTER THE CONTRACT FOR CONSTRUCTION HAS BEEN EXECUTED. NO OTHER FORM IS ACCEPTABLE. REFER TO SECTION 01 2500 FOR REQUIREMENTS GOVERNING SUBMISSION, REVIEW, AND ACCEPTANCE OF REQUESTS FOR SUBSTITUTIONS.

DATE OF CONTRACTOR'S REQUEST:

WE REQUEST CONSIDERATION TO USE:

_____ Proposed Substitution

Instead of the following specified item:

SECTION	PAGE	PARAGRAPH	DESCRIPTION

REASON FOR REQUEST: ATTACH DETAILED EXPLANATIONS FOR ALL REASONS THAT APPLY.

___ Specified product is not acceptable to authorities having jurisdiction.

___ Specified product has been discontinued by manufacturer.

___ Specified product cannot be provided within Contract Time because of circumstances beyond control of Contractor.

___ Product substitution offers substantial benefit to the Owner in the form of cost savings, time savings, energy conservation, sustainability advantages, other valuable considerations, net of the Architect's/Engineer's cost to evaluate the technical compatibility and modify the building design, if required.

Attached are the following supporting data:

	Test Reports
	Samples
	Drawings
	ICC-ES Evaluation Report
	Performance Data
	Dimensional Data

ATTACH COMPARISON DATA OF THE PROPOSED SUBSTITUTION AS AN ATTACHMENT TO THE FOLLOWING SUBSTITUTION REQUEST FORM. INCLUDE HIGHLIGHTED PRODUCT DATA AND/OR SPECIFICATIONS TO POINT OUT THE TEC SIMILARITIES OR DIFFERENCES BETWEEN THE SPECIFIED PRODUCT AND THE PROPOSED SUBSTITUTION PRODUCT. INDICATE NAME, BRAND, CATALOG NUMBERS, MANUFACTURER, LIST SIGNIFICANT VARIATIONS FROM SPECIFIED PRODUCT.

ATTACH COMPARISON DATA BETWEEN THE PROPOSED SUBSTITUTFOR NON-TECHNICAL CHARACTERISTICS (E.G. COST BENEFIT, SCHEDULE BENEFIT, FUNCTIONALITY IMPROVEMENT, ENERGY SAVINGS, ETC.)

PROPOSED CHANGE TO CONTRACT SUM:

DEDUCT	\$	ADD	\$

CONTRACTOR HAS INVESTIGATED THE PROPOSED SUBSTITUTION AND CERTIFIES THE FOLLOWING:

Function, appearance, and quality of proposed substitution is equal or superior to the specified item, except as stated in comparison data.

Proposed substitution will have no adverse effects on other installers, construction schedule, or specified warranty requirements.

Proposed substitution does not adversely affect dimensions, clearances, or weight for functioning and maintenance.

Contractor will modify other parts of the Work as necessary to make all parts of the Work complete and functional without additional costs beyond the proposed change to Contract Sum stated above.

Cost data stated herein are complete and Contractor waives any further claims for additional costs incurred by Architect/Engineer's recommendation and Owner's acceptance of substitution.

If accepted, Contractor will provide submittals per requirements of Section 01 3300.

POINT BY POINT COMPARATIVE DATA SHEET

LIST ALL PROPERTIES SPECIFIED. (PHYSICAL, TEST, STANDARD, WARRANTY, CODE, PERFORMANCE)	SPECIFIED PRODUCT	PROPOSED PRODUCT	IF THERE IS A DIFFERENCE EXPLAIN WHY THIS SHOULD BE ACCEPTED

EXAMPLE POINT BY POINT COMPARATIVE DATA SHEET (EXAMPLE INFORMATION IN ITALICS)

LIST ALL PROPERTIES SPECIFIED. (PHYSICAL, TEST, STANDARD, WARRANTY, CODE, PERFORMANCE)	SPECIFIED PRODUCT	PROPOSED PRODUCT	IF THERE IS A DIFFERENCE EXPLAIN WHY THIS SHOULD BE ACCEPTED
EX. WARRANTY	5YR	7YR	EXCEEDS SPECIFICATION
EX. ASTM 123	PASSED	EXCEEDS ASTM 123.	MEETS ASTM 124 WHICH HAS A LOWER AIR INFILTRATION RATE THAN ASTM 123

CONTRACTOR'S SIGNATURE

Contractor Name:	
Name and Title of Person Signing:	
Signature:	
Date:	

ARCHITECT'S RECOMMENDATION

APPROVE SUBSTITUTION: PROVIDE SUBMITTALS PER SPECIFICATION SECTION 01 3300.

APPROVE SUBSTITUTION AS NOTED: PROVIDE SUBMITTALS PER SPECIFICATION SECTIONS 01 3300.

REJECT SUBSTITUTION: PROVIDE ORIGINALLY-SPECIFIED PRODUCTS.

SUBSTITUTION PROPOSAL RECEIVED TOO LATE: PROVIDE ORIGINALLY-SPECIFIED PRODUCTS.

SIGNED BY:

DATE:

END OF SECTION

**SECTION 01 3100
PROJECT MANAGEMENT AND COORDINATION**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information/Interpretation (RFIs).
 - 4. Project meetings.

1.2 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare written summary identifying individuals or firms proposed for each portion of the Work, including those who are to supply products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Sections covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 working days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.3 GENERAL COORDINATION PROCEDURES

- A. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.4 COORDINATION

- A. Coordinate scheduling, submittals, and Work of various Specification sections and Drawing notes to ensure efficient and orderly sequence of installation of interdependent construction elements .
- B. Coordinate selection of products specified in different Specification sections for compatibility. Compatibility among Contractor's options is not assured by listed manufacturers or products in the Specifications or Drawings, but must be provided by the Contractor.

- C. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities.
- D. Coordinate construction operations for efficient and orderly installation of each part of the Work. Coordinate construction operations for Work specified in different Sections that depend on each other for proper installation, connection, and operation. Lay out Work to provide required headroom and width in egress paths.
- E. Coordination of installation location and sequence between elements of the Work is a basic Contract requirement. Locations of concealed elements shown on Drawings that connect to exposed elements are intended only as diagrams; final locations are the responsibility of the Contractor within Contract requirements.
- F. Locations of access panels shown on Drawings are intended only diagrammatically. Locate access panels to provide convenient and direct location to concealed controls and equipment.
- G. Coordinate horizontal and vertical space requirements, support sizes and locations, and installation of Work indicated diagrammatically on Drawings, including concealed spaces. Route concealed pipes, ducts, conduit, and similar items in orderly manner with long dimensions parallel to column grid lines where possible.
- H. Coordinate locations of concealed framing, blocking, and other supports with manufacturer requirements for support and anchorage.
- I. Utilize spaces efficiently to maximize accessibility for subsequent Work, for maintenance, for repairs, and to permit removal and replacement.
- J. Coordinate equipment locations and utility supplies to such locations with manufacturer product information for operational clearances and for maintenance access.
- K. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- L. Coordinate enclosure of Work with required inspections and tests to minimize need for uncovering Work for those purposes.
- M. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion [and for portions of Work designated for Owner's partial occupancy].
- N. Preparation of coordination drawings for work of different trades is Contractor's option. Such drawings will not be reviewed by the Architect.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.

- e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
- 1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 - 2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 - 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 - 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 - 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 - 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 - 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 - 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 - 9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's sole responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
- C. Coordination Digital Data Files: Prepare coordination digital data files.
- 1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
 - 2. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format.
 - 3. BIM File Incorporation: Develop and incorporate coordination drawing files into Building Information Model established for Project.
 - a. Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts before submittal. Indicate where conflict resolution requires modification of design requirements by Architect.
 - 4. Architect will supply Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Digital Data Software Program: Drawings are available in .

1.6 REQUESTS FOR INFORMATION OR INTERPRETATION (RFIS)

- A. RFIs will be accepted and processed by the Architect only on Contract Documents prepared by the Architect or its consultants that are sealed and have been issued for construction.
 - 1. Requests for information or interpretation of preliminary drawings or specifications shall be made by normal correspondences, not by RFI. Architect's responses to such requests do not constitute Contract requirements for the Work.
- B. Owner Documents: Requests for information or interpretation of Owner-prepared Contract Documents shall be made by normal correspondence, not by RFI. Owner is responsible for responding to such requests. Provide contemporaneous copies to Architect.
- C. Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- D. Submission of an RFI constitutes representation that the Contractor requires additional information about the Contract Documents after having made careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, and prior project correspondence or documentation.
- E. If upon evaluation of the RFI the Architect finds that the requested information is contained in the Contract Documents or by other documents or methods as outlined in paragraph above, the Owner has the option to obtain reimbursement from the Contractor for costs incurred by the Owner for the Architect's services and expenses made necessary in answering such requests.
- F. RFI Submission: RFIs shall be submitted in electronic form using the Architect's InfoExchange internet site. Paper RFIs, e-mail, faxes, and other media are not acceptable and will be returned without action.
 - 1. At the beginning of the Project, the Architect will set up accounts for Contractor's authorized personnel, including log-in information and passwords. Users will be able to change passwords after logging in for the first time.
 - 2. Complete the form provided by the InfoExchange software in full. Forms with boxes that are blank will not be processed.
 - 3. In the box marked "Question", insert the text of the request together with Contractor's suggested resolution and other pertinent information.
 - 4. Sketches, diagrams, product data sheets, and other supplementary information may be attached to the form as PDF electronic files, but the actual text of the request must be entered into the form. Forms that have "See attached document" or language of similar import in the Question box will be not be processed.
 - 5. Web Address: <http://infox.gspnet.com/userweb/login/login.aspx>
- G. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow at least five working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 - 2. Architect's action may include request for additional information or clarification, in which case Architect's time for response will date from time of receipt of additional information or clarification from Contractor.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 2600.

- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within working days of receipt of the RFI response.
- H. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three working days if Contractor disagrees with response.
- I. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by RFI number. Submit copies of log at Owner-Architect-Contractor meetings .
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were returned without action or withdrawn.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's response was received.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within five working days of the meeting.
- B. Preconstruction Conference: Schedule and conduct preconstruction conference before starting construction, at a time convenient to Owner and Architect, but not later than working days after execution of the Agreement.
 - 1. Conduct the conference to review responsibilities and personnel assignments.
 - 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Record and distribute meeting minutes.
 - 4. Agenda: Discuss items of significance that could affect progress.
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.

- x. First aid.
 - y. Security.
 - z. Progress cleaning.
 - aa. Infection Control Risk Assessment (IRCA).
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect [and Owner's Commissioning Authority] of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration.
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mock-ups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at weekly intervals.
- 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of proposal requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
4. Minutes: Record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 3200
EXECUTION**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Hot work permit.
- B. Related Requirements:
 - 1. Section 01 1000: Limitations on use of Project site.
 - 2. Section 01 3300: Procedures for submitting surveys.
 - 3. Section 01 7700: Submission of final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 02 4119: Demolition and removal of selected portions of the building.
 - 5. Section 07 8413: Patching penetrations in fire-rated construction.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.
- C. Hot Work: Work involving welding, brazing, torch cutting, grinding, powder-driven fasteners, torch-applied roofing, or other activities that generate sparks capable of causing combustion. Refer to NFPA 51B and 601.

1.3 INFORMATIONAL SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Qualification Data: For land surveyor.
- C. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- D. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - 1. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- E. Certified Surveys: Submit two [<>] copies signed by land surveyor.
- F. Final Property Survey: Submit drawing files for the survey in AutoCAD version acceptable to Owner and 5 [<>] printed full-size copies showing the Work performed and record survey data.

1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: Legally qualified to practice in jurisdiction where Project is located and experienced in providing land-surveying services for commercial construction projects of similar size and complexity.
- B. Cutting and Patching:
 - 1. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.[<>]
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Electrical wiring systems.
 - j. Operating systems of special construction.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.
- D. Hot Work Permits: Before starting activities involving hot work, obtain hot work permit from the Owner.

PART 2 -PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.
- B. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. EXISTING CONDITIONS DISCLAIMER: The Owner and Architect specifically disclaim any warranty as to existence and locations of underground and other concealed utilities and construction indicated on Drawings as existing. The Architect prepared Drawings on the basis of information provided by Owner and did not verify the accuracy of that information. Contractor is therefore advised that actual conditions may differ from those depicted on Drawings or in other Contract Documents.
- B. Before beginning sitework, investigate and verify the existence and location of underground utilities,[<>] and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Supply location data for work related to Project that must be performed by public utilities serving Project site.
- C. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where appropriate, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Inspect products immediately before installation. Do not install defective or damaged products.

3.2 PREPARATION

- A. Existing Utility Information: Supply information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings, including requirements for operation, maintenance access, and other required clearances.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the existing column grid/structure. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

- B. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. Project structures have been designed for strength, stability, and safety in completed form. Until completed, provide temporary bracing and supports needed for strength, stability, and safety of construction in progress and for protection of persons and property.
- B. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and in unoccupied spaces.
- C. Comply with manufacturer instructions and recommendations for installing products.
- D. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- F. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachments: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for thermal expansion and contraction, deflection, and normal building movements.
 - 3. Coordinate installation of anchorages. Supply 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 such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Isolate products from incompatible materials as needed to prevent deterioration.
- K. Coordinate enclosure of the Work with required inspections and tests so as to minimize need for uncovering Work for those purposes.
- L. Install products at time and under conditions that will ensure best possible results. Maintain conditions required for product performance until Substantial Completion.

1. Do not install products during weather conditions that adversely affect installation or performance of completed Work.
 2. Do not install products sensitive to exterior weather conditions such as extreme temperatures or moisture without the facility being enclosed or the products being sufficiently protected.
- M. Tolerances: Where specific tolerances are not stipulated by Contract Documents or manufacturer recommendations, comply with applicable industry standards.
1. Tolerances are noncumulative unless otherwise stated.

3.6 HANDICAPPED ACCESSIBILITY REQUIREMENTS

- A. ADA Requirements: In addition to Code requirements governing handicapped accessibility, install Work in conformance with US Department of Justice publication 2010 ADA Standards for Accessible Design.
1. Where ADA compliance is indicated in Contract Documents, comply with this document.
 2. Contractor is cautioned that normal construction industry tolerances may not be acceptable with respect to maximum and minimum dimensions in this document.
 3. Refer questions regarding interpretation of ADA requirements to Owner, with copies of correspondence to Architect.
 4. Where Code requirements and ADA requirements are at variance, comply with the more restrictive requirements unless otherwise directed by Owner.
- B. The Architect's site observations for compliance with handicapped accessibility requirements are limited in scope and frequency per its contract with the Owner. The Owner will therefore rely on the Contractor's skill, judgment, and expertise for compliance with handicapped accessibility requirements and will look solely to the Contractor for such compliance.

3.7 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch to restore surfaces to original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Specific cutting and patching requirements applicable to individual units of Work may be specified in other Specification sections.
- D. Requirements of this Section apply to all Work of Contract. Refer to Divisions 21 through 33 for additional requirements and limitations on cutting and patching.
- E. Temporary Support: Provide temporary support of work to be cut.
- F. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- G. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 1000.
- H. Existing Utility Services and Mechanical/Electrical Systems: Where existing services or systems are required to be removed, relocated, or abandoned, bypass such services or systems before cutting to minimize interruption to occupied areas.
- I. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- J. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even, plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to weathertight condition and ensures thermal and moisture integrity of building enclosure.
- K. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, and similar materials from adjacent finished surfaces.

3.8 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's vendor personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's vendors.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's vendor personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.9 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Clean spills, misapplications, and other accidents immediately as they occur.
- D. Do not remove or obscure UL labels, third-party certification labels, or other required labeling.
 1. Remove liquid spills promptly.
- E. Installed Work: Keep installed work clean. Clean installed surfaces according to instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- F. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- G. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- H. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section .
- I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.10 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 01 9113.
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.11 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer instructions for temperature and relative humidity.

3.12 DAMAGE CORRECTIONS

- A. Provide new conforming Work to replace damaged work that cannot be repaired or refinished in place. Damage includes soiling or staining that cannot be satisfactorily cleaned.

1. Remove interior gypsum products exposed to water during construction period. Remove entire gypsum board panels; do not cut and patch gypsum board.
 2. Remove insulation, acoustic ceiling components, and other moisture-sensitive products exposed to water during construction period.
 3. Remove metal stud framing components exposed to water during construction period that have visible rust.
- B. If there is evidence of water intrusion into partially completed areas, remove portions of gypsum board and other construction at shafts, plenums, and other concealed areas to check for moisture damage and for mold and mildew growth. Examine concealed areas in presence of Architect.
1. Remove components in entirety that exhibit water damage, mold, or mildew.
 2. Remove gypsum board in whole panels.
 3. Do not install replacement Work until concealed areas are completely dried and causes of water intrusion have been remedied.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 3300
SUBMITTAL PROCEDURES**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Owner's responsive action.
- B. Informational Submittals: Written information that does not require Owner's approval. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. Submittal Method: The Architect will provide access to Newforma document management software without cost to the Contractor. Contractor shall use the standard transmittal forms provided by the Architect. Using e-mail or other proprietary software for the submittal and processing of submittals is not acceptable.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Owner's receipt of submittal.
 - 1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Owner will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. If resubmittal is necessary, process it in same manner as initial submittal.
 - 3. Allow 15 days for processing each resubmittal.
 - 4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- D. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space on label or beside title block to record Contractor's review and approval markings.
 - 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Contractor.
 - d. Name and address of subcontractor.
 - e. Name and address of supplier.
 - f. Name of manufacturer.
 - g. Unique identifier, including revision number.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
 - j. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

- F. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Owner will return submittals, without review, received from sources other than Contractor.
- G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- H. Use for Construction: Use only final submittals with mark indicating action taken by Owner in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Material safety data sheets are not required and should not be included in the product data submittal.
 - 4. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals.
 - k. Compliance with recognized trade association standards.
 - l. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
- D. Samples: Prepare physical units of materials or products, including the following:
 - 1. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

2. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 3. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Attach label on unexposed side that includes the following:
 - a. Generic description of Sample.
 - b. Product name or name of manufacturer.
 - c. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- E. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
1. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 2. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."
- B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- I. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

- J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- M. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.
 - 4. Required installation tolerances.
 - 5. Required adjustments.
 - 6. Recommendations for cleaning and protection.
- N. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Owner.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents. Submittals not containing the Contractor's stamp will be returned without action.

3.2 ARCHITECT/ENGINEER'S ACTION

- A. General: Architect/Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
 - 1. Review of submittals by Architect/Engineer is only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.
 - 2. Review of submittals by Architect/Engineer is not for purpose of determining the accuracy and completeness of dimensions and quantities, or substantiating installation instructions.
- B. Re-submittal Review: Submittals marked as "Exceptions Noted – Resubmit" or "Resubmit" will be re-reviewed and stamped with an action stamp. Engineer will mark the stamp appropriately to indicate action taken. If the re-submittal is marked as "Exceptions Noted – Resubmit" or "Resubmit", the Owner will deduct the amount of the Engineer's compensation for subsequent re-submittal review from the final payment to the Contractor as provided on the Bid Form.
- C. Action Submittals: Architect/Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Owner will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. No Exceptions Noted: Where submittal is marked "No Exceptions Noted", the Work covered by the submittal may proceed provided it complies with the Contract Documents.
 2. Exceptions Noted: Where submittal is marked "Exceptions Noted", the Work covered by the submittal may proceed provided it complies with both Owner's notations and corrections on the submittal and the Contract Documents.
 3. Exceptions Noted - Resubmit: Where the submittal is marked "Exceptions Noted – Resubmit", do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity for the product submitted. Revise or prepare a new submittal according to Owner's notations and corrections.
 4. Resubmit: Where the submittal is marked "Resubmit", do not proceed with the Work covered by the submittal. Prepare a new submittal for a product that complies with the Contract Documents.
 5. Information: Where the submittal is marked "Information", the Architect/Engineer is neither approving nor disapproving the information provided within the submittal. This indication may be placed upon design calculations from Contractor's Owners, schedules, installation procedures, standards or regulations, etc.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 3324
STRUCTURAL SUBMITTALS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Structural submittals include shop drawings, design calculations, diagrams, illustrations, schedules, performance charts, nomenclature charts, samples, brochures and other data prepared by the Contractor or any subcontractor, manufacturer, supplier, fabricator, or distributor and which illustrate some portion of the Project.
- B. Submittals by the Contractor are not a part of the Contract Documents.

1.2 RELATED SECTIONS

- A. Section 01 3300 – Submittal Procedures

1.3 SUBMITTAL PROCEDURES

- A. Prior to the initial submittal, Contractor shall submit to the Architect/Structural Engineer a completed Submittal Information and Schedules form given in Appendix I.
- B. Submittals shall be accompanied by a transmittal letter with the following information:
 - 1. Project name.
 - 2. Contractor's name.
 - 3. Date submitted.
 - 4. Description of items submitted; identify work and product by Specification Section.
 - 5. Number of drawings and other pertinent data.
- C. Provide blank space on each submittal for the Architect/Structural Engineer's review stamp.
- D. The type and number of submittals for each item shall be in accordance with Section 01 3300.
- E. Contractor shall direct specific attention on the submittal to any deviation from the Contract Documents.
- F. Electronic submittals shall comply with the following standards:
 - 1. Structural submittals made in electronic format must be in a generally accepted format that can be viewed by Adobe Reader or similar, and capable of receiving comments and notations in Adobe Writer, Bluebeam Revu or similar. When creating the file, no permissions should be restricted - All actions should be ALLOWED. Submittals should be issued as a single BOUND set with each page bookmarked with the correct sheet number. Submittals not formatted in this manner will be returned to the contractor for review and resubmittal.
 - 2. Send electronic files to the following email address and copy the Structural Engineer: shopdrawings@sdlal.com.

1.4 CONTRACTOR RESPONSIBILITY

- A. Contractor shall make all submittals in advance of installation or construction to allow the Architect/Structural Engineer sufficient time for review.
- B. Contractor shall stamp and sign each sheet of shop drawings and product data, and sign or initial each sample to certify compliance with requirements of Contract Documents. SUBMITTALS RECEIVED

WITHOUT THE CONTRACTOR'S STAMP OF REVIEW WILL BE RETURNED TO THE CONTRACTOR FOR REVIEW AND RESUBMITTAL.

- C. Contractor shall understand that the submittal of the required documents does not constitute compliance with the requirements of the Contract Documents; only submittals reviewed by the Architect/Structural Engineer constitute compliance.
- D. It is the Contractor's responsibility to furnish equipment, materials, and labor for the Project which meets the requirements of the codes and authorities quoted as well as the Contract Documents. Proprietary items specified herein only establish a minimum functional and aesthetic standard and it is incumbent upon the Contractor to ascertain conformance of these proprietary items or any proposed substitution with the codes and authorities.
- E. By reviewing, approving and submitting shop drawings, product data, or samples, Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, member sizes catalog numbers, and similar data and that he has checked and coordinated shop drawings with the requirements of the Project and of the Contract Documents.
- F. Work requiring shop drawings, whether called for by the Contract Documents or requested by the Contractor, shall not commence until the submission has been reviewed by the Architect/Structural Engineer. Work may commence if the Contractor verifies the accuracy of the Architect/Structural Engineer's corrections and notations and complies with them without exception and without requesting change in Contract Sum or Contract Time.

1.5 ARCHITECT/STRUCTURAL ENGINEER REVIEW

- A. Architect/Structural Engineer will review submittals with reasonable promptness. For scheduling purposes, allow 10 business days in Structural Engineer's office exclusive of delivery time.
- B. Architect/Structural Engineer's review or corrections refer only to the general arrangement and conformance of the subject of the submittals with the design concept of the project and with the information given in the Contract Documents. Under no conditions should the Contractor consider the review to include the dimensions, quantities, and details of the items nor the approval of an assembly in which the item functions.
- C. Architect/Structural Engineer's review shall not relieve the Contractor from responsibility for errors or omissions in the submittals.
- D. Architect/Structural Engineer's review of submittals shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has directed specific attention to the deviation at the time of submission and the Architect/Structural Engineer has given written approval to the specific deviation.
- E. Architect/Structural Engineer's review of submittals shall not be construed as authorizing any change in the Contract Sum or Contract Time.
- F. Structural Engineer will return a maximum of three reviewed hard copies for submittals that are not submitted electronically.

1.6 SHOP DRAWINGS

- A. Present in a clear and thorough manner. Title each drawing with Project name and number; identify each element of drawings by reference to sheet number and detail of Contract Documents.

- B. All shop drawings shall list the Contract Documents used in their production (date, title, revision number, etc.).
- C. Reproduction of Structural Drawings for shop drawings is not permitted.
- D. Identify field dimensions; show relationship to adjacent or critical features of Work or products.
- E. Electronic shop drawings submitted shall meet the requirements of Section 1.03.
- F. A copy of the marked structural shop drawings with the Architect/Structural Engineer's review stamp is to be maintained at the job site. If electronic shop drawings are being used, a hard copy with all final markups is to be maintained at the job site.

1.7 PRODUCT DATA

- A. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.
- B. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information which is not applicable.
- C. Provide manufacturer's preparation, assembly, and installation instructions.

1.8 SAMPLES

- A. Submit full range of manufacturer's standard finishes except where more restrictive requirements are specified, indicating colors, textures, and patterns.
- B. Submit samples to illustrate functional characteristics of products, including parts and attachments as required by Architect/Structural Engineer.
- C. Approved samples which are of proper size may be incorporated in Work.
- D. Label each sample with identification.
- . Field Finishes: Provide full samples at Project, at location acceptable to Architect/Structural Engineer, as required by individual Specification Section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed work.

1.9 RESUBMITTALS

- A. When submittals are returned to the Contractor with the Architect/Structural Engineer's corrections the Contractor shall make the required corrections.
- B. Contractor shall direct specific attention on the resubmittal to all revisions including those requested by the Architect/Structural Engineer on previous submission.

1.10 DISTRIBUTION

- A. Distribute reproductions of shop drawings, copies of product data, and samples which bear the Architect/Structural Engineer's review stamp to job site file, Record Documents file, subcontractors, suppliers, other affected contractors, and other entities requiring information.

B. Only reviewed shop drawings are considered acceptable for use during construction.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

**APPENDIX I
SUBMITTAL INFORMATION AND SCHEDULES**

PROJECT _____

CONTRACTOR _____

CONTRACTOR'S ADDRESS _____

PROJ. MANAGER _____ PHONE (____) _____ FAX (____) _____

SUPERINTENDENT _____ PHONE (____) _____ FAX (____) _____

MOBILIZATION DATE _____

PROJECTED SUBMITTAL DATES

FOUNDATION, CONCRETE & REINFORCING		STRUCTURAL STEEL		MASONRY	
SUBMITTAL	DATE	SUBMITTAL	DATE	SUBMITTAL	DATE
SITE PREPARATION & EQUIPMENT INFORMATION		FABRICATOR / ERECTOR QUALIFICATIONS		GROUT & MORTAR MIX	
CONCRETE MIX DESIGN		ANCHOR ROD & EMBEDDED ITEMS		BLOCK PRISM & COMP. STRENGTH	
FOUNDATION REINFORCING		ERECTION & DETAIL DRAWINGS		REINFORCING	
		DECK		WRITTEN PROCEDURES	

REMARKS:

COMPLETED BY _____ DATE _____

END OF APPENDIX I

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. References and standards.
- D. Inspection agencies and services.
- E. Contractor's construction-related professional design services.
- F. Contractor's design-related professional design services.
- G. Control of installation.
- H. Tolerances.
- I. Manufacturers' field services.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300 - Submittal Procedures: Submittal procedures.
- B. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.3 REFERENCE STANDARDS

1.4 DEFINITIONS

- A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.
- B. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.
 - 1. Design Services Types Required:
 - a. Construction-Related: Services Contractor needs to provide in order to carry out the Contractor's sole responsibilities for construction means, methods, techniques, sequences, and procedures.
 - b. Design-Related: Design services explicitly required to be performed by another design professional due to highly-technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design.
- C. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

1.5 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
 - 1. Temporary sheeting, shoring, or supports.

2. Temporary scaffolding.
3. Temporary bracing.
4. Temporary stairs or steps required for construction access only.
5. Temporary hoist(s) and rigging.

1.6 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Base design on performance and/or design criteria indicated in individual specification sections.
 1. Submit a Request for Interpretation to Architect if the criteria indicated are not sufficient to perform required design services.
- C. Scope of Contractor's Professional Design Services: Provide for the following items of work:
 1. Structural Design of Formwork: As described in Section 03 1000 - Concrete Forming and Accessories.
 2. Concrete Mix Design: As described in Section 03 3000 - Cast-in-Place Concrete. No specific designer qualifications are required.
 3. Structural Design of Steel Connections: As described in Section 05 1200 - Structural Steel Framing.
 4. Structural Design of Steel Decking: As described in Section 05 3000 - Steel Decking.
 5. Structural Design of Metal Framing: As described in Section 05 4000 - Cold-Formed Metal Framing.
 6. Structural Design of Metal Fabrications: As described in Section 05 5000 - Metal Fabrications.
 7. Structural Design: Include physical characteristics, engineering calculations, and resulting dimensional limitations as described in Section 08 4313 - Aluminum-Framed Storefronts.
 8. Structural Design of Canopy: As described in Section 10 7316.13 - Metal Canopies.
 9. Design of Structural Components: Include development of shop drawings, and performing shop and site work, as described in Section 13 3419 - Metal Building Systems.
 10. Sprinkler Layout: Coordinate with ceiling installation, detailed pipe layout, and hydraulic calculations as described in Section 21 1300 - Fire-Suppression Sprinkler Systems.

1.7 SUBMITTALS

- A. See Section 01 3300: Submittal Procedures, for submittal procedures.
- B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for Owner's information.
 1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
 - a. Full name.
 - b. Professional licensure information.
 - c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.
- C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
 1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
 2. Include required product data and shop drawings.
 3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
 4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.
- D. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
 1. Include:
 - a. Date issued.
 - b. Project title and number.

- c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Compliance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
 - 2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
- 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- F. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- G. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
- 1. Submit report within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
- H. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
- 1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
 - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.8 QUALITY ASSURANCE

- A. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.9 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.10 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Owner will employ and pay for services of an independent testing agency to perform specified testing.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.3 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
 - 5. Perform additional tests and inspections required by Architect.
 - 6. Attend preconstruction meetings and progress meetings.
 - 7. Submit reports of all tests/inspections specified.

- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory [] hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.5 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

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END OF SECTION

**SECTION 01 4113.01
FLORIDA CODES AND STANDARDS**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. List of codes enforced by Florida Agency for Health Care Administration (AHCA) Office of Plans and Construction (OPC) which have been used in the design and development of this Project.
 - 2. Abbreviations and acronyms used in Contract Documents to identify such codes.
- B. Other applicable codes and regulatory requirements are listed on the Drawings.

1.2 QUALITY ASSURANCE

- A. Code requirements are minimums, and Contract Documents may include more stringent requirements. Notify Architect immediately if requirements of the Contract Documents appear to be in conflict with codes listed herein.
- B. The date of the code is that as listed in this section. Comply with dated editions of publications included by reference in codes.

1.3 SCHEDULE OF CODES

- A. The following is a partial list of the codes enforced by Florida Agency for Health Care Administration (AHCA) Office of Plans and Construction (OPC) which have been used in the design and development of this project. See the Plan Review Data on the Project Information Sheet in the Drawings for additional codes and regulatory requirements that apply to the Project.
- B. Federal Codes and Regulations:
 - 1. 2010 - The Americans with Disabilities Act (ADA) and Accessibility Guidelines for Building and Facilities
- C. State Codes:
 - 1. 2020, 7th Edition Florida Building Code
 - a. Florida Accessibility Code
 - 2. 2020, 7th Edition Florida Prevention Code
 - 3. 2018 NFPA 1, Uniform Fire Code, with Florida Amendments
 - 4. 2018 NFPA 101, Life Safety Code, with Florida Amendments
 - 5. 2020, 7th Edition Florida Building Code Energy Conservation
 - 6. 2020, 7th Edition Florida Building Code Plumbing
 - 7. 2020, 7th Edition Florida Building Code Mechanical
 - 8. 2020, 7th Edition Florida Accessibility Code
 - 9. 2020, 7th Edition Florida Building Code Test Protocols for High Velocity Hurricane Zones
 - 10. 2018 Edition Guidelines for Design and Construction of Hospitals
- D. The following State Fire Codes are adopted by the State of Florida Fire Marshall Rule 69A-3.012 F.A.C They are adopted and incorporated by reference as part of the uniform Fire Safety Standards adopted by the State of Florida Fire Marshall and are applicable to those Buildings and structures specified in paragraphs (a) and (b) of subsection (1) of Section 633.022 F.S.:
 - 1. NFPA 1 – Uniform Fire Code (2018 Florida Edition).
 - 2. NFPA 10 – 2018, Standard for Portable Fire Extinguishers
 - 3. NFPA 11 – 2016, Standard for Low-, Medium-, and High- Expansion Foam
 - 4. NFPA 12 – 2015, Standard on Carbon Dioxide Extinguishing Systems
 - 5. NFPA 13 – 2013, Standard for the Installation of Sprinkler Systems
 - 6. NFPA 14 – 2016, Standard for Installation of Standpipe and Hose Systems
 - 7. NFPA 15 – 2017, Standard for Water Spray Fixed Systems for Fire Protection
 - 8. NFPA 16 – 2015, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
 - 9. NFPA 17 – 2017, Standard for Dry Chemical Extinguishing Systems

10. NFPA 17A – 2017, Standard for Wet Chemical Extinguishing Systems
11. NFPA 20 – 2016, Standard for the Installation of Stationary Pumps for Fire Protection.
12. NFPA 24 – 2016, Standard for Installation of Private Fire Service Mains and Their Appurtenances
13. NFPA 25 – 2017, Standard for Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, except that quarterly flow tests shall be required for those systems supplied by a municipal water supply.
14. NFPA 30 – 2018, Flammable and Combustible Liquids Code
15. NFPA 31 – 2011, Standard for the Installation of Oil Burning Equipment
16. NFPA 33 – 2016, Standard for Spray Application Using Flammable and Combustible Materials
17. NFPA 37 – 2018, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
18. NFPA 51 – 2018, Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes
19. NFPA 51B-2014, Standard for Fire Prevention During Welding, Cutting and Other Hot Work
20. NFPA 54 – 2018, National Fuel Gas Code
21. NFPA 70 – 2017, National Electric Code
22. NFPA 72 – 2016, National Fire Alarm and Signaling Code
23. NFPA 75 – 2017, Standard for the Protection of Information Technology Equipment
24. NFPA 80 – 2016, Standard for Fire Doors and Other Opening Protectives
25. NFPA 90A – 2018, Standard for the Installation of Air Conditioning and Ventilating Systems
26. NFPA 90B – 2018, Standard for the Installation of Warm Air Heating and Air Conditioning Systems
27. NFPA 91 – 2015, Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids
28. NFPA 92 – 2015, Standard for Smoke Control Systems
29. NFPA 99 – 2018, Health Care Facilities Code
30. NFPA 101 – Life Safety Code (2018 Edition) Adopted by the Federal Government, through the Center for Medicare/Medicaid Services; and enforced by Florida AHCA.
31. NFPA 101 – Life Safety Code (2015 Florida Edition).
32. NFPA 101A – 2016, Guide on Alternative Approaches to Life Safety
33. NFPA 105 – 2016, Standard for Smoke Door Assemblies and Other Opening Protectives
34. NFPA 110 – 2016, Standard for Emergency and Standby Power Systems
35. NFPA 111 – 2013, Standard on Stored Electrical Energy Emergency and Standby Power Systems
36. NFPA 211 – 2013, Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances
37. NFPA 221 – 2018, Standard for High Challenge Fire Walls, Fire Walls and Fire Barrier Walls
38. NFPA 232 – 2017, Standard for the Protection of Records
39. NFPA 241 – 2013, Standard for Safeguarding Construction, Alteration and Demolition Operations
40. NFPA 252 – 2017, Standard Methods of Fire Test of Door Assemblies
41. NFPA 253 – 2015, Standard Methods of Test for Critical Flux of Floor Covering Systems Using a Radiant Heat Energy Source
42. NFPA 257 – 2017, Standard for Fire Tests of Window and Glass Block Assemblies
43. NFPA 259 – 2013, Standard Test Method for Potential Heat of Building Materials
44. NFPA 260 – 2013, Standard Methods of Test and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture
45. NFPA 261 – 2013, Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes
46. NFPA 265 – 2015, Standard Method of Test for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls
47. NFPA 286 – 2015, Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
48. NFPA 601 - 2015; Standard for Security Services in Fire Loss Prevention
49. NFPA 701 – 2015, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
50. NFPA 703 – 2018, Standard for Fire Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials
51. NFPA 704 – 2017, Standard System for the Identification of the Hazards of Materials for Emergency Response
52. NFPA 1221 – 2016, Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems

- 53. NFPA 1963 – 2014, Standards for Fire Hose Connections
- 54. NFPA 2001 – 2015, Standard on Clean Agent Fire Extinguishing Systems
- 55. Additional NFPA Standards (in the editions as indicated) as listed in the 2020 FBC Chapter 35 Reference Standards.
- 56. Additional NFPA Standards (in editions indicated); listed in 2018 Edition of NFPA 101, Life Safety Code.

1.4 FLORIDA PRODUCT APPROVAL (FPA) AND NOTICES OF ACCEPTANCE (NOA'S)

- A. Products utilized for this project shall have Florida Product Approvals (FPA) and Notice of Acceptance (NOA's) which represent the basis-of-design products for this project.
- B. If a specified equal product is to be installed in lieu of the product identified (if allowed in the Specification), the Contractor must furnish a current FPA or NOA for the substituted product.

PART 2 -PRODUCTS – NOT USED

PART 3 -EXECUTION – NOT USED

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END OF SECTION

SECTION 01 4524
STRUCTURAL TESTING/INSPECTION AGENCY SERVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section summarizes the responsibility of the Contractor and the Structural Testing/Inspection Agency in the performance of the testing/inspection specified in the Contract Documents.
- B. Neither the observation of the Architect/Structural Engineer in the administration of the contract, nor tests/inspections by the Testing/Inspection Agency, nor approvals by persons other than the Architect/Structural Engineer shall relieve the Contractor from his obligation to perform the work in accordance with the Contract Documents.

1.2 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 01 4000 - Quality Requirements.

1.3 REFERENCES

- A. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.
- C. American Council of Independent Laboratories - Recommended Requirements for Independent Laboratories Qualifications.

1.4 SELECTION AND PAYMENT

- A. Owner will employ and pay for the structural testing/inspection services that are required by the Contract Documents.
- B. Contractor shall pay for any additional structural testing/inspection required for work or materials not complying with Contract Documents due to negligence or nonconformance.
- C. Contractor shall pay for any additional structural testing/inspection required for his convenience.

1.5 STRUCTURAL TESTING/INSPECTION REQUIREMENT SUMMARY

- A. Specific structural testing/inspection requirements are given in the following specification sections:
 - Section 03 2000 - Concrete Reinforcement
 - Section 03 3000 - Cast-in-Place Concrete
 - Section 03 6200 - Non-Shrink Grout
 - Section 04 2200 - Structural Concrete Masonry
 - Section 05 1200 - Structural Steel
 - Section 05 3000 - Steel Decking
 - Section 31 2310 - Excavating, Backfilling, and Compacting for Structures

PART 2 - MATERIALS – NOT USED.

PART 3 - EXECUTION

3.1 STRUCTURAL PRECONSTRUCTION MEETING

- A. A structural preconstruction meeting may be conducted at the construction site by the Structural Engineer to discuss quality issues. The parties involved may be the Architect, Contractor, Structural Testing/Inspection Agency, appropriate subcontractors, suppliers, and detailers.

3.2 STRUCTURAL TESTING/INSPECTION AGENCY'S RESPONSIBILITIES

- A. Cooperate with the Contractor and provide timely service.
- B. Upon arriving at the construction site, sign in and notify the Contractor of presence.
- C. Select the representative samples that are to be tested/inspected.
- D. Perform tests/inspections as outlined in Contract Documents, the applicable codes, and as directed by the Structural Engineer.
- E. Report work and materials not complying with Contract Documents immediately to the Contractor and Structural Engineer.
- F. Leave copies of field notes with the Contractor prior to leaving the construction site. Field notes shall include the message given to the Contractor, date, time of message, name of Contractor's representative informed, type and location of work or materials tested/inspected, whether the work or materials complies with Contract Documents and name of the Structural Testing/Inspection Agency's representative.
- G. Report and distribute results of tests/inspections promptly in the form of written reports. Copies of the reports for this project will be furnished to the Owner, Contractor, Architect, Structural Engineer, and the Local Building Authorities.
- H. Structural Testing/Inspection Agency shall not alter requirements of Contract Documents, approve or reject any portion of the work, or perform duties of the Contractor.
- I. If providing special inspections, reports shall include all items as required by the [International Building Code Special Inspection Schedules / Florida Threshold Inspection Plan] provided by the Structural Engineer.

3.3 CONTRACTOR'S RESPONSIBILITIES

- A. Provide copy of Contract Documents to the Structural Testing/Inspection Agency.
- B. Arrange the preconstruction meeting to discuss quality issues.
- C. Notify the Structural Testing/Inspection Agency sufficiently in advance of operations to allow assignment of personnel and scheduling of tests.
- D. Cooperate with Structural Testing/Inspection Agency and provide access to work.
- E. Provide samples of materials to be tested in required quantities.
- F. Furnish copies of mill test reports when requested.

- G. Provide storage space for Structural Testing/Inspection Agency's exclusive use, such as for storing and curing concrete testing samples.
- H. Provide labor to assist the Structural Testing/Inspection Agency in performing tests/inspections.

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END OF SECTION

**SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Security requirements.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Field offices.

1.2 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

1.3 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power, consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.

1.4 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Internet Connections: Minimum of one; DSL modem or faster.

1.5 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.

1.6 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.

- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.7 FENCING

- A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks. Coordinate specific fencing requirements and extend to fencing with the Owner.

1.8 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.9 VEHICULAR ACCESS AND PARKING

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.10 WASTE REMOVAL

- A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- C. Provide containers with lids. Remove trash from site periodically.
- D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

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END OF SECTION

SECTION 015639

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 SUMMARY

- A. Tree Preservation work includes, but is not limited to:
1. Protection of existing trees and all other items indicated to remain in place.
 2. Maintenance of protected areas.
 3. Clearing and grubbing activity within protected areas.
 4. Damage compensation.

1.03 APPLICABLE REGULATIONS

- A. Comply with all applicable local laws and regulations concerning tree preservation as well as the specific requirements stated elsewhere in the Specifications.

PART 2 - PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 PROTECTION OF EXISTING TREES TO REMAIN

- A. Tagging and Fencing:
1. Trees to remain shall be tagged and protective fencing installed prior to any construction, demolition, or other disturbance.
 2. Protective fencing shall be installed at the dripline of the tree to be protected unless otherwise noted on the Plans.
 3. The area inside the protective fencing will heretofore be referred to as the protected area.
 4. The Contractor shall verify tagged trees and fence locations in field with the Landscape Architect prior to any construction or demolition activity.

3.02 MAINTENANCE OF PROTECTED AREA

A. No construction activity shall occur inside protected areas other than that landscape construction which is required for completion of the project.

1. Construction activity includes, but is not limited to, building material storage, waste stockpiling, topsoil stockpiling, equipment storage or parking, disposal of waste materials of any kind, draining or flushing of tanks, canisters, drums, or other containers, trailer parking or storage, and demolition activity.

B. No traffic, vehicular or pedestrian, shall encroach upon protected areas.

1. This includes, but is not limited to, personal passenger vehicles, construction vehicles, grading machinery, and loading/lifting machinery.

C. No material, machine, vehicle, or part thereof shall encroach above or below the vertical plane of the protective fencing into the protected area.

D. The Contractor shall notify the Landscape Architect of any activity which might infringe or encroach upon the protected area prior to start of said activity.

3.03 ENCROACHMENT UPON PROTECTED AREA

A. If encroachment into the protected area does occur, notify the Landscape Architect immediately.

3.04 ACTIVITY INSIDE PROTECTED AREAS

A. Clearing and Grubbing:

1. Clearing of small trees, shrubs, and herbaceous plants in the protected area shall be performed by hand only.

2. Bulldozers and/or drag chain operations are not permissible inside protected areas.

3. Grubbing of stumps shall be performed in two (2) ways:

a. Stumps under 6" diameter shall be pulled by chain.

i. The vehicle used for pulling shall remain outside the protected area (dripline of the tree to remain) whenever possible.

ii. Under no circumstance shall the pulling vehicle encroach into the protected area by more than 1/3 of the distance from the trunk of tree to remain to the nearest edge of the protected area (dripline).

iii. Any depressions shall be filled with topsoil and leveled to grade by hand.

b. Stumps over 6" diameter shall be ground out to a depth of 4" below grade.

- i. Stump grinder shall be trailer mounted and maneuvered by light truck or bobcat.
 - ii. Wood chips generated by grinding shall be removed and any depressions shall be filled with topsoil and leveled to grade.
 - iii. These operations shall be performed by hand.
- B. Grading:
 - 1. Any grading which may be required inside the protected area shall be performed by hand only.
 - 2. No grading or earthmoving machinery shall be allowed inside the protected area.
 - 3. Provide grade stakes and verify grade elevations with the Landscape Architect prior to commencement of any grading activity.
- C. Preparation of soil for seeding and/or sodding within the protected areas shall be done by hand or with a power rake and shall not disturb soil more than 2" deep to prevent damage to feeder root systems.
 - 1. No chemical herbicides shall be used within protected areas unless the Contractor can obtain written manufacturer's guarantee that herbicide will not harm tree health or growth and obtain written approval from the Landscape Architect.
 - 2. Contact the Landscape Architect prior to seed or sod preparation within protected areas to determine exact seed and/or sod limits.
- D. Stake locations of all utilities which encroach protected areas.
 - 1. Contact the Landscape Architect prior to clearing or trenching for utilities to verify that staked location is the least obtrusive to protected area.

3.05 REMOVAL OF PROTECTIVE FENCING

- A. Protective fencing may be removed to facilitate landscape work in the protected area.
 - 1. All Work in the protected area shall be initiated within 24 hours of fence removal.
 - 2. If landscape work in the protected area is delayed or interrupted for more than 24 hours, then protective fencing shall be reinstalled until such time as work in the protected area is resumed.
 - 3. Protective fencing shall be reinstalled after substantial completion of Work inside protected area and shall remain until substantial completion of the project or approval of the Landscape Architect, whichever is later.

3.06 DAMAGE COMPENSATION

- A. Any damage occurring to trees to remain or protected areas or removal of trees to remain in the

protected areas caused by neglect, unauthorized encroachment and/or inadequate protection enforcement as determined by the Landscape Architect shall be the responsibility of the General Contractor.

1. Financial compensation for said damage or removal shall be determined by the Landscape Architect and Owner as per the following guidelines on a per occurrence basis.

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END OF SECTION 015639

**SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete for temporary and permanent erosion control structures indicated on drawings.
- B. Section 31 1000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
- C. Section 31 2200 - Grading: Temporary and permanent grade changes for erosion control.
- D. Section 32 9200- Turf and Grasses: Permanent turf for erosion control.
- E. Section 32 9300 - Plants: Permanent plantings for erosion control.

1.3 REFERENCE STANDARDS

- A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus 2021.
- B. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity. 1999a (Reapproved 2014).
- C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles 2015.
- D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles 2015a.
- E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile 2021a.
- F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples 2017 (Reapproved 2021).
- G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit Current Edition.
- H. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control 1995.
- I. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service 2015.

1.4 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.

- B. Also comply with all more stringent requirements of State of Florida Erosion and Sedimentation Control Manual.
- C. Comply with all requirements of Lake City, Florida for erosion and sedimentation control .
- D. Best Management Practices Standard: FHWA FLP-94-005.
- E. Runoff Calculation Standard for Urban Areas: USDA TR-55.
- F. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- G. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
 - 1. Obtain and pay for permits and provide security required by authority having jurisdiction.
- H. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- I. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 - 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 - 2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
- J. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
 - 1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 2. Prevent development of ruts due to equipment and vehicular traffic.
 - 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- K. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 - 1. Prevent windblown soil from leaving the project site.
 - 2. Prevent tracking of mud onto public roads outside site.
 - 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 - 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- L. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 - 2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
- M. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- N. Open Water: Prevent standing water that could become stagnant.
- O. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.5 SUBMITTALS

- A. Erosion and Sedimentation Control Plan:
 - 1. Submit within 2 weeks after Notice to Proceed.
 - 2. Submit not less than 30 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.
 - 3. Include:
 - a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
 - b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
 - c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
 - d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
 - e. Other information required by law.
 - f. Format required by law is acceptable, provided any additional information specified is also included.
 - 4. Obtain the approval of the Plan by authorities having jurisdiction.
 - 5. Obtain the approval of the Plan by Owner.
- B. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- C. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
- D. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Mulch: Use one of the following:
 - 1. Straw or hay.
 - 2. Wood waste, chips, or bark.
 - 3. Erosion control matting or netting.
 - 4. Cutback asphalt.
 - 5. Polyethylene film, where specifically indicated only.
- B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.
- C. Bales: Air dry, rectangular straw bales.
 - 1. Cross Section: 14 by 18 inches, minimum.
 - 2. Bindings: Wire or string, around long dimension.
- D. Bale Stakes: One of the following, minimum 3 feet long:
 - 1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
 - 2. Wood, 2 by 2 inches in cross section.
- E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
 - 1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
 - 2. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D4491.
 - 3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.

4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
 5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
 6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.
 7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
- F. Silt Fence Posts: One of the following, minimum 5 feet long:
1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
 2. Softwood, 4 by 4 inches in cross section.
 3. Hardwood, 2 by 2 inches in cross section.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3 SCOPE OF PREVENTIVE MEASURES

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Construction Entrances: Traffic-bearing aggregate surface.
1. Width: As required; 20 feet, minimum.
 2. Length: 50 feet, minimum.
 3. Provide at each construction entrance from public right-of-way.
 4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- C. Linear Sediment Barriers: Made of silt fences.
1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
 - c. Along the toe of cut slopes and fill slopes.
 - d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at maximum of 200 feet apart.
 - e. Across the entrances to culverts that receive runoff from disturbed areas.
 2. Space sediment barriers with the following maximum slope length upslope from barrier:
 - a. Slope of Less Than 2 Percent: 100 feet..
 - b. Slope Between 2 and 5 Percent: 75 feet.
 - c. Slope Between 5 and 10 Percent: 50 feet.
 - d. Slope Between 10 and 20 Percent: 25 feet.
 - e. Slope Over 20 Percent: 15 feet.
- D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
 2. Straw bale row blocking entire inlet face area; anchor into pavement.
- E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.
- F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

- G. Soil Stockpiles: Protect using one of the following measures:
 - 1. Cover with polyethylene film, secured by placing soil on outer edges.
 - 2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
 - 1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
 - 2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.
- I. Temporary Seeding: Use where temporary vegetated cover is required.

3.4 INSTALLATION

- A. Traffic-Bearing Aggregate Surface:
 - 1. Excavate minimum of 6 inches.
 - 2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - 3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.
- B. Silt Fences:
 - 1. Store and handle fabric in accordance with ASTM D4873/D4873M.
 - 2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 - 3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
 - 4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 - 5. Install with top of fabric at nominal height and embedment as specified.
 - 6. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
 - 7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 - 8. Fasten fabric to wood posts using one of the following:
 - a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gage, 0.083 inch shank diameter.
 - b. Five staples per post with at least 17 gage, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
 - 9. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
 - 10. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.
- C. Straw Bale Rows:
 - 1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
 - 2. Install bales so that bindings are not in contact with the ground.
 - 3. Embed bales at least 4 inches in the ground.
 - 4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
 - 5. Fill gaps between ends of bales with loose straw wedged tightly.
 - 6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
- D. Mulching Over Large Areas:
 - 1. Dry Straw and Hay: Apply 2-1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
 - 2. Wood Waste: Apply 6 to 9 tons per acre.
 - 3. Asphalt: Apply at 1200 gallons per acre.
 - 4. Erosion Control Matting: Comply with manufacturer's instructions.

- E. Mulching Over Small and Medium Areas:
 - 1. Dry Straw and Hay: Apply 4 to 6 inches depth.
 - 2. Wood Waste: Apply 2 to 3 inches depth.
 - 3. Pine Needles: Apply 2 to 3 inches depth.
 - 4. Asphalt: Apply 1/4 gallon per square yard.
 - 5. Erosion Control Matting: Comply with manufacturer's instructions.
- F. Temporary Seeding:
 - 1. When hydraulic seeder is used, seedbed preparation is not required.
 - 2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
 - 3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
 - 4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
 - 5. Incorporate fertilizer into soil before seeding.
 - 6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
 - 7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
 - 8. Repeat irrigation as required until grass is established.

3.5 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
 - 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 - 2. Remove silt deposits that exceed one-third of the height of the fence.
 - 3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- D. Straw Bale Rows:
 - 1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
 - 2. Remove silt deposits that exceed one-half of the height of the bales.
 - 3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- E. Clean out temporary sediment control structures weekly and relocate soil on site.
- F. Place sediment in appropriate locations on site; do not remove from site.

3.6 CLEAN UP

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

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END OF SECTION

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Procedures for Owner-supplied products.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Identification of Owner-supplied products.
- B. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- C. Section 01 4000 - Quality Requirements: Product quality monitoring.
- D. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.3 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.2 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. See Section 01 4000 - Quality Requirements, for additional source quality control requirements.
- C. Use of products having any of the following characteristics is not permitted:
 - 1. Made using or containing CFC's or HCFC's.
 - 2. Containing lead, cadmium, or asbestos.
- D. Where other criteria are met, Contractor shall give preference to products that:
 - 1. Result in less construction waste. See Section 01 7419

2.3 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.4 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.1 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.

3.2 OWNER-SUPPLIED PRODUCTS

- A. See Section 01 1000 - Summary for identification of Owner-supplied products.
- B. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- C. Contractor's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.3 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.4 STORAGE AND PROTECTION

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.
 - 1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.
- C. Store and protect products in accordance with manufacturers' instructions.
- D. Store with seals and labels intact and legible.
- E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- F. For exterior storage of fabricated products, place on sloped supports above ground.
- G. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- H. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- I. Comply with manufacturer's warranty conditions, if any.
- J. Do not store products directly on the ground.
- K. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- L. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- M. Prevent contact with material that may cause corrosion, discoloration, or staining.

- N. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- O. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

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END OF SECTION

**SECTION 01 6400
OWNER SUPPLIED PRODUCTS**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Owner-supplied, Owner-installed products (OSOI).
 - 2. Owner-supplied, Contractor-installed products (OSCI).
 - 3. Coordination and storage of Owner-supplied products.
- B. Related Sections:
 - 1. Division 22 Section "Domestic Water Piping" for water connections.
 - 2. Division 22 Section "Drainage and Vent Piping" for wastewater connections.
 - 3. Division 26 Section "Equipment Installation and Wiring Systems" for power connection.

1.2 INFORMATIONAL SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Schedule of dates for receiving utility rough-in requirements and delivery of OSOI and OSCI products.

1.3 QUALITY ASSURANCE

- A. Installation of equipment shall be done by experienced workers trained and skilled in the appropriate crafts.

1.4 RESPONSIBILITIES

- A. Owner:
 - 1. Arrange for Shop Drawings, Product Data, Samples, and manufacturer installation instructions to be delivered to Contractor according to Contractor's Construction Schedule.
 - 2. Arrange and pay for delivery of Owner-Supplied items according to Contractor's Construction Schedule.
 - 3. Inspect all Owner-supplied items for damage after delivery with Contractor present.
 - 4. Receive, unload, and store OSOI items at Project site.
 - 5. Provide copies of manufacturer installation requirements for utility rough-in work.
 - 6. If Owner-Supplied items are damaged, defective, or missing, Owner will arrange for replacement.
 - 7. Arrange for manufacturer's field services.
 - 8. Inform Contractor of earliest possible delivery dates for Owner-Supplied items. Using Owner-Supplied earliest possible delivery dates, Contractor shall designate delivery dates of Owner-Supplied items in Contractor's Construction Schedule.
 - 9. Arrange for final utility connections of OSOI items.
- B. Contractor:
 - 1. Using Owner-supplied earliest possible delivery dates, Contractor shall designate delivery dates of Owner-supplied items in Contractor's Construction Schedule.
 - 2. Review Shop Drawings, Product Data, and Samples and return them to Owner, with a copy to the Architect, noting discrepancies or anticipated problems in installation of the item.
 - 3. Provide utility rough-in work per equipment manufacturer installation instructions for both Contractor-installed and Owner-installed equipment.
 - 4. Receive, unload, and store OSCI items at Project site.
 - 5. Designate areas for storage of OSOI items.
 - 6. Protect OSCI items from damage during storage and handling, including damage from exposure to weather.
 - 7. If Owner-Supplied items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.

1.5 COORDINATION

- A. Extent of Owner-Supplied products are indicated in separate Owner Supplied Equipment Manual.

PART 2 -PRODUCTS

2.1 MATERIALS

- A. Rough-in and connection materials are specified in Divisions 22 and 26 and as required by manufacturer installation instructions.

PART 3 -EXECUTION

3.1 COORDINATION

- A. Coordinate equipment installation with blocking in walls, mechanical and electrical rough-in work, and special conditions indicated on submittal data received in accordance with its schedule of dates as agreed upon with the Owner.

3.2 INSTALLATION

- A. Install OSCI items per manufacturer instructions.
- B. Set equipment square and level, securely anchored, with joints flush and tight, sealed where required.

3.3 CLEANING, RESTORING FINISHES

- A. After completion of installation, and completion of other major work in the area, remove protective coverings, if any, and clean equipment internally and externally. Restore exposed and semi-exposed finishes to remove abrasions and other damages; polish exposed metal surfaces and touch-up painted surfaces. Provide new replacements for Work that cannot be successfully cleaned or repaired.

3.4 TESTING, START-UP AND INSTRUCTIONS

- A. Contractor shall inform Owner when start-up procedures can begin, shall supply power as necessary and have electrical and mechanical installers available to assist as required.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

PART 1 GENERAL

1.1 POLICY

- A. HCA's policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. HCA's goal is zero waste, however, we realize that some waste will occur on a project building site that cannot be reduced or recycled. Therefore, contractors shall divert 95% of total project waste from the landfill.

1.2 REFERENCES

- A. HCA's policy requires a minimum landfill diversion of 95% of all construction and demolition debris. For additional references to diversion from landfills see www.usgbc.org, Materials and Resources, Credit 2. Contractor should become familiar with LEED reporting requirements in the event that HCA chooses to pursue LEED certification for an individual project.
- B. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
1. ASTM INTERNATIONAL (ASTM)
 - a. (2001) Development and Implementation of a Pollution Prevention Program
 2. S. GREEN BUILDING COUNCIL (USGBC)
 3. LEED (2002; R 2005; 2009) Leadership in Energy and Environmental Design(tm) Green Building Rating System for New Construction (LEED-NC)

1.3 DEFINITIONS

- A. **Comingled vs Source Separated C&D Debris:** Comingled debris is material that mixes all types of construction and demolition material in one container. Source separated, keeps several or all materials segregated from each other. Benefits of comingling include reduced labor and no need for education, and space saving. Benefits of source separation are higher value material due to lack of contamination, opportunity to involve labor and ability to use materials such as gypsum, masonry and rock product on site.
- B. **Construction and Demolition Debris:** Uncontaminated solid waste resulting from the construction, remodeling, repair and demolition of utilities, structures and roads; and uncontaminated solid waste resulting from land clearing. Such waste includes, but is not limited to bricks, concrete and other masonry materials, soil, rock, wood (including painted, treated and coated wood and wood products), land clearing debris, wall coverings, plaster, drywall, plumbing fixtures, non-asbestos insulation, roofing shingles and other roof coverings, asphaltic pavement, glass, plastics that are not sealed in a manner that conceals other wastes, empty buckets ten gallons or less in size and having no more than one inch of residue remaining on the bottom, electrical wiring and components containing no hazardous liquids, and pipe and metals that are incidental to any of the above. Solid waste that is not C&D debris (even if resulting from the construction, remodeling, repair and demolition of utilities, structures and roads and land clearing) includes, but is not limited to asbestos waste, garbage, any item containing hazardous materials such as fluorescent light ballasts or transformers, fluorescent lights, tires, drums, containers greater than ten gallons in size, any containers having more than one inch of residue remaining on the bottom and fuel tanks. Specifically excluded from the definition of construction and demolition debris is solid waste (including what otherwise would be construction and demolition debris) resulting from any processing technique that renders individual waste components unrecognizable, such as pulverizing or shredding.
- C. **Debris Management Coordinator (DMC):** The contractor must appoint a DMC to oversee the activities relating to managing C&D debris on the site. The DMC will complete and submit the Waste Management Plan (form B) and collect records and data supporting disposal and diversion amounts.

- D. **Land Clearing Debris:** Is vegetative matter, soil and rock resulting from activities such as land clearing and grubbing, utility line maintenance or seasonal or storm-related cleanup such as trees, stumps, brush and leaves and including wood chips generated from these materials. Land clearing debris does not include yard waste that has been collected at the curb.
- E. **Landfill Diversion:** Means keeping material out of the landfill by reducing the amount of waste produced, reusing material, recycling, composting, incineration, or other mean.
- F. **Recycle:** To process materials so that they may be used again. They can be used for their original purpose or another. Recycling is less preferable than reduction or reuse because often the processing takes up to 60% of the energy to transport and remake the new item. Example: pulverizing drywall as a soil amendment.
- G. **Reuse:** Using an item again for the same purpose. Example: reusable pallets.
- H. **Source Reduction:** The act of decreasing waste or the toxicity of waste. Examples: Waste reduction: Ordering wallboard to the correct height and using cutoffs to fill holes. Reduced toxicity: Paint that contains no VOCs.
- I. **Waste Prevention:** Not creating waste through concepts such as source reduction, recycling, composting and reuse.
 - 1. The following is a partial list of C&D debris materials. The project waste may include but is not limited to these materials.
 - a. Asphalt
 - b. Bricks
 - c. Carpet and carpet pad
 - d. Corrugated cardboard
 - e. Clean dimensional wood
 - f. Wood (Note 1)
 - g. Concrete and rock (Note 2)
 - h. Concrete masonry units (CMU), slump stone (decorative concrete blocks)
 - i. Dirt (Note 2)
 - j. Doors
 - k. Excavated Dirt & Rock (Note 2)
 - l. Ferrous & nonferrous metals such as banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 - m. Fluorescent lamps and ballasts (Note 1)
 - n. Gypsum wallboard (drywall)
 - o. Land clearing debris & green materials (i.e. tree trimmings) (Note 2)
 - p. Paint (Note 1)
 - q. Plastic wrap, buckets, PVC
 - r. Roofing shingles
 - s. Used beverage containers
 - t. Note 1: Several common debris materials may be considered toxic, hazardous, or not easily recycled with other C & D debris. In these instances, follow appropriate disposal methods. These materials include but are not limited to:
 - u. Magnetic ballasts
 - v. Older fluorescent lamps containing polychlorinated biphenyls (PCB's)
 - w. All fluorescent lamps that may contain mercury
 - x. Treated wood
 - y. Painted wood that may contain lead-based paint
 - z. Unused paint
 - aa.
 - bb. Note 2: Excavated materials and land clearing debris should be diverted from landfills. If the project is pursuing LEED certification this type of debris must be kept separate and cannot be counted toward LEED diversion rates.

1.4 SUMMARY

- A. The following document outlines waste management criteria for all HCA construction and demolition projects. Guidelines established in Section 01 7419 are intended for the use of contractor and contractor's affiliates.
- B. Materials subject to the diversion requirements of this contract are the materials that are generated within the construction limits of this project, to include any materials associated with meeting the terms of this contract.

1.5 WASTE DIVERSION GOALS

- A. HCA has established that this Project shall generate the least amount of waste possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- B. Acknowledging that Construction and Demolition waste will be generated, HCA requires that the maximum quantity of waste as is economically feasible shall be minimized on the front end and diverted from the landfill. HCA will request an estimate of the project's diversion rate and an explanation for diversion rates that are not 95%.

1.6 MANAGEMENT

- A. With regard to these goals, the Contractor shall develop a Waste Management Plan (WMP) for HCA's review. Once this plan undergoes review by HCA, Contractor will be notified of project award or project denial. HCA will base project award on a number of factors included in the "best value evaluation" model. The WMP is a critical component of project award. This plan shall describe and document each of the following diversion and non-diversion activities:
 - 1. Salvage
 - 2. Reuse
 - 3. Source Separation Construction and Demolition Debris Recycling
 - 4. Co-mingled Construction and Demolition Debris Recycling
 - 5. Landfill Disposal
- B. Develop and implement a waste management plan as specified in this section. Take a proactive, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in program.
- C. The Debris Management Coordinator (DMC) shall be responsible for instructing workers and overseeing and documenting the results of the Waste Management Plan (WMP).
- D. Construction and demolition waste includes products of demolition and construction, excess of unusable C&D materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work.
- E. In the management of waste, consideration shall be given to the availability of viable markets, the condition of the materials, the ability to provide the material in suitable condition, and in a quality acceptable to available markets.

1.7 SUBMITTALS

- A. The following submittals are required to be approved by HCA:
 - 1. Waste Management Plan (WMP Forms A & B) to indicate how waste will be diverted from landfills.
 - 2. Closeout submittal including weight verification of all construction and demolition material. The percent diversion shall be documented in this submittal. This spreadsheet shall be submitted with the final closeout package submitted to HCA.

PART 1 PRODUCTS

2.1 WASTE MANAGEMENT PLAN (WMP)

- A. The complete Waste Management Plan (WMP) consists of two sequential documents: WMP-Form A and WMP-Form B. Contractor must complete WMP-Form A before commencement of debris management activities. Once awarded project, the Debris Management Coordinator (DMC) must assume debris management responsibilities including the submission of WMP- Form B and records and data to support disposal and diversion percentages.
1. WMP-Form A (Submit with Proposal): WMP-Form A must be submitted with bid documents and is a prerequisite of project award. This document should describe planned C&D debris management activities. HCA may require Contractor to revise and resubmit the plan and does not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement.
 2. WMP-Form B: Once the WMP-Form A is submitted, reviewed, and approved, DMC contractor must submit WMP-Form B on a monthly basis. Form B documents actual diversion percentages. Additionally, Contractor must submit records and data that verify:
 - a. Total waste generated
 - b. Total waste diverted by recycling, reuse, or salvage
 - c. The type of waste generated/diverted
 3. The quantity of waste materials shall be by weight (tons). Landfill records and materials receipts shall be submitted as a formal material submittal.

2.2 WMP-FORM A - ESTIMATE OF PERCENT REDUCTION CONTRACTOR WILL ATTAIN DURING PROJECT

- A. Contractor will complete and submit the general WMP documents with the Contractor's proposal for HCA review. If approved, this WMP will serve as the basis for the monthly records and data submittals and WMP-Form B. Contractor must submit initial WMP with project proposal to avoid disqualification. This plan should include separate sections for demolition and construction projects. See Appendix A for the WMP forms and corresponding instructions for completing the form. Contractor has the option of completing the WMP forms in Appendix A or creating his own. If he creates his own, the plan must contain the following:
1. Name of individuals on the Contractor's staff responsible for waste prevention and management.
 2. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.
 3. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.
 4. Characterization, including estimated types and quantities, of the waste to be generated.
 5. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number, including a copy of the permit or license for each facility.
 6. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by HCA.
 7. Description of the means by which any recyclable materials identified in item (E) above will be protected from contamination.

2.3 WMP-FORM B - ACTUAL PERCENTAGE REDUCTION CONTRACTOR ATTAINS DURING PROJECT

- A. WMP-Form B will account for all construction and demolition waste management activity from project commencement to termination. This form must be completed and submitted on a monthly basis. Failure to meet the 95% diversion requirement must be addressed with a written explanation of disparities along with WMP-Form B. Contractor has the option of completing the WMP forms in Appendix A or creating his own. If he creates his own, the plan must contain the following:
1. Waste Characterization: Document the waste to be generated, including types and quantities by weight.

2. Diversion Options: List each material to be salvaged, reused, or recycled during the course of the Project, the proposed local market for each material, and the estimated net cost savings/ additional costs from diversion. "Net" means that the following have been subtracted from the cost of separating and recycling: (a) revenue from the sale of recycled or salvaged materials and (b) landfill tipping fees saved due to diversion of materials from the landfill.
3. Waste Reduction Calculations: Calculated end-of-project rates as a percentage of total waste.
4. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals/organizations. Indicate whether organization is tax exempt.
5. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
6. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight, tickets, receipts, and invoices.
7. LEED Submittal (If applicable): LEED letter template for Credit MR 2.1, signed by Contractor, indicating total waste material, quantities diverted and means by which it is diverted and a statement that requirements for the credit have been met.
8. Landfill Options: Include landfill contact information and costs. Provide the name of the landfills, respective tipping fees, and the total projected cost of landfill disposal.
9. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
10. Timeline: Submit a timeline of project commencement and termination in addition to a plan for periodic onsite updates of C&D debris handling.
11. Meetings: Describe the regular meetings to be held to address how to manage waste. At a minimum, discuss waste management goals and issues at pre-construction meetings and regularly scheduled job-site meetings.
12. Handling and Transportation: Describe methods of separation including the use of containers, their location, and labeling system used to identify the different materials. Describe transportation/hauling procedures, which may include but are not limited to contracting a recycling hauler, arranging transportation with the local market to be used and various means of self-transportation.
13. Negotiated approval of the Contractor WMP must be obtained before the commencement of waste management activities. Once notified of WMP approval, Contractor may begin WMP implementation.

PART 1 EXECUTION

3.1 WASTE MANAGEMENT PLAN (WMP) EXECUTION

- A. Debris Management Coordinator (DMC): The Contractor shall designate an on site party (or parties) responsible for waste management instruction, oversight and documentation for the entire project.
- B. Depending on the size and complexity of the project, Contractor may either designate a full time DMC or assign responsibility to the job supervisor or appropriate personnel.
- C. Distribution: The Contractor shall distribute copies of the WMP and other pertinent information to the Job Site Foreman and to each Subcontractor.
- D. Instruction: The Contractor shall provide on-site instruction of correct separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.
- E. Source Separation: The Contractor shall identify and clearly label a specific area to facilitate separation of materials for diversion activities. Recycling and waste bin areas are to be kept neat, clean and clearly marked in order to avoid contamination of materials.
- F. If hazardous materials are found at anytime, the contractor shall halt work and inform HCA. The following is a list of appropriate source separation procedures:
 1. Separate recyclable materials from construction and demolition debris to the maximum extent possible. Separate recyclable materials by type.
 2. Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.

3. Stockpile processed materials on-site without mixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 4. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
 5. Store components off the ground and protect from weather.
- G. Construction and Demolition Debris Removal:
1. Buildings and their appurtenances are property of the Contractor. Revenues and savings from recycling, salvage, and reuse shall accrue to the Contractor.
 2. Remove construction and demolition debris from project site on a regular basis. Do not allow construction and demolition debris to accumulate on-site.
 3. Transport construction and demolition debris from property and dispose of it legally.
 4. Burning of construction and demolition debris is not permitted.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

HCA Waste Management Plan - Form A - Estimated Costs (Sheet 3)**EXAMPLE****Projected Diversion Activities - Construction & Demolition Materials**

A	B	C	D	E	F	G	H
Material Type	Quantity Estimate (tons)	Estimated % to be Recycled	Destination	Transportation	Handling/ Transport Costs	Projected Revenue or Tip Fee Savings	Total Cost or Savings

Total net cost (+) or savings (-) from diversion activities \$_____**Note: Failure to submit WMP- Form A in a timely manner may be cause for HCA to render the bid nonresponsive.**

HCA Waste Management Plan - Form A - Instructions

Bidders are required to complete and submit a WMP- Form A. This is the initial job site plan of action and will be used to evaluate project award. It is mandatory for the bidding Contractor to provide all of the following information regarding construction and demolition debris management on the project. This must be completed prior to any material removal from the site.

Follow these procedures to maximize recycling at your job site:

1	Separate and recycle wood, cardboard, metal, drywall, and other recyclable materials.	☐
2	Ensure that all containers and recycling dumpsters are convenient and clearly labeled.	☐
3	Train new personnel on recycling container location and which materials are recyclable.	☐
4	Move mixed C&D debris and recycling containers close to each other making it convenient to recycle.	☐
5	Store materials to prevent loss from damage.	☐
6	Check recycling and mixed C&D containers daily for mis-sorted materials.	☐
7	Provide training to people who are mis-sorting recyclable materials.	☐
8	Identify large quantities of waste that are not being recycled, and have DMC evaluate options for marketing the material.	☐

Action Items:

A	Complete this WMP - Form A and post on-site.	☐
B	Commit subcontractors to recycle in Subcontractor Agreement.	☐
C	Keep subcontractors and workers aware of and informed on the C&D Debris Management Program.	☐
D	Require individuals to properly sort recyclables and hold them responsible for mis-sorted loads.	☐
E	Track and promote diversion results.	☐

Complete the following (3) sheets of the WMP- Form A and submit with proposal.

*** Note: Failure to submit WMP- Form A in a timely manner may be cause for HCA to render the bid nonresponsive.**

HCA Waste Management Plan - Form A - Recyclable Materials (Sheet 1)

Material Type	Condition of Material*	On-site Handling	Hauling Procedures	Final Destination
Example: Asphalt/Concrete	large chunks	stockpile for crushing	haul for on-site use	hospital site for use as backfill
Asphalt/Concrete				
Brick/Masonry/Tile				
Building Materials **				
Carpet & Pad				
Cardboard				
Ceiling Tile				
Concrete				
Drywall				
Field Office Waste				
Paint				
Plastic Film, Sheeting, Wrap				
Scrap Metal				
Aluminum				
Copper				
Steel				
Other Metals				
Unpainted Wood & Pallets				
Window Glass				
Other				

* Check with recycler & hauler for any specifications regarding the required condition/s of material (e.g. size restrictions, packaging, other variables.)

** Doors, windows, fixtures, shingles, lumber, insulation, sheetgoods, etc.

Signed: _____

Date: _____

Note: Failure to submit WMP- Form A in a timely manner may be cause for HCA to render the bid nonresponsive.

HCA Waste Management Plan - Form A - Project Details (Sheet 2)

Project: _____

Date: _____

1. Estimated Project Waste

Total Quantity	Total Cost/Ton	Percentage to be Diverted from Landfill*

2. Describe methods for avoiding contamination of recyclables

3. Waste Management Meetings to be held

Pre-Construction	_____	Description _____
Monthly	_____	
Other	_____	

* Contractor must submit bid for 95% recycling unless bid is accompanied by written documentation regarding reason for lower recycling rate.
Note: Failure to submit WMP- Form A in a timely manner may be cause for HCA to render the bid nonresponsive.

HCA Waste Management Plan - Form A - Estimated Costs (Sheet 3)

EXAMPLE

Projected Diversion Activities - Construction & Demolition Materials

A	B	C	D	E	F	G	H
Material Type	Quantity Estimate (tons)	Estimated % to be Recycled	Destination	Transportation	Handling/ Transport Costs	Projected Revenue or Tip Fee Savings	Total Cost or Savings
concrete	5000	60%	stockpile on site	20cy truck	$=($6+$11-$13)*B6*60\%$	$=\$12*B6*60\%$	$=G6-F6$
concrete	5000	60%	stockpile on site	20cy truck	\$ 18,000	\$ 96,000	\$ 78,000
Cost to landfill = \$12/ton Cost to crush concrete = \$6 Cost to transport concrete = \$11 Cost of delivered crushed stone = \$13 Percentage of crushable concreted = 60%					Cost to crush & transport	Savings by not landfilling	Savings by not landfilling, less cost to crush

Total net cost (+) or savings (-) from diversion activities \$ _____

Note: Failure to submit WMP- Form A in a timely manner may be cause for HCA to render the bid nonresponsive.

EXAMPLE

[illegible]

Note: Failure to submit WMP- Form A in a timely manner may be cause for HCA to render the bid nonresponsive.

HCA Waste Management Plan - Form B

Start Date:

End Date:

Total # Months: _____

											Cost for Option 1	Cost for Option 2		
A	B	C	D	E	F	G	H	I	J	K	M	O	Q	S
Material	Generated Debris		Recycled Debris (%)		Salvage/ Reuse Debris (%)		Landfilled Debris (%)		Total Diverted Debris		Cost to Landfill All C&D Debris	Cost to Landfill Non-Diverted Material	Cost to Recycle, Salvage or Reuse	Total Savings (Cost of Option 1 - 2)
	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est (D+F)	Actual	Actual	Actual	Actual	Actual
	(tons)		%	%	%	%	%	%	(tons)	(E+G)	\$/Ton	%	\$	\$
Brick/Masonry/Tile														
Building Materials*														
Carpet & Pad														
Cardboard														
Ceiling Tile														
Concrete														
Drywall														
Field Office Waste														
Paint														
Plastic Film, Sheeting, Wrap														
Scrap Metal														
Aluminum														
Copper														
Steel														
Other Metals														
Unpainted Wood/Pallets														
Window Glass														
Other (describe)														
Other (describe)														
Total									0.00	0.00	\$0.00	\$0	0	\$0

TOTAL PROJECT SAVINGS \$ _____

* Doors, windows, fixtures, shingles, lumber, insulation, sheetgoods, etc.

Note: Contractor must transfer WMP Form A estimates to Form B to demonstrate the cumulative amount of waste generated and diverted.

Diversion percentages account for amount and type of materials kept out of the landfill to date.
 Diversion percentages account for amount and type of materials kept out of the landfill to date.
 sale.

Contractor Signature: _____

Date: _____ Affidavit: _____

HCA Waste Management Plan - Form B

EXAMPLE

Start Date: _____ End Date: _____

Total # Months: _____

										Cost for Option 1	Cost for Option 2			
A	B	C	D	E	F	G	H	I	J	K	M	O	Q	S
Material	Generated Debris		Recycled Debris (%)		Salvage/ Reuse Debris (%)		Landfilled Debris (%)		Total Diverted Debris		Cost to Landfill All C&D Debris	Cost to Landfill Non-Diverted Material	Cost to Recycle, Salvage or Reuse	Total Savings (Cost of Option 1-2)
	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est (D+F)	Actual Tonnage	Actual	Actual	Actual	Actual
	from Form A	tons	from Form A	%	from Form A	%	from Form A	%	from Form A	(E+G)	\$/Ton	\$%	\$	\$
Example: Asphalt/Concrete	130	159	60%	80%	0%	5%	40%	25%	$=(B11*D11)+(B11*F11)$	$=(C11*E11)+(C11*G11)$	$=C11*12$	$=(C11*I11)*32$	$=(6+11-13)*C11*(E11+G11)$	$=M11-O11-Q11$
Example: Asphalt/Concrete	130	159	60%	80%	0%	5%	40%	25%	78	135	\$ 5,088	\$ 1,272	\$ 676	\$ 3,140
Example: Metal	55	69	80%	85%	0%	0%	20%	25%	$(B13*D13)+(B13*G13)$	$=(C13*E13)+(C13*G13)$	$=C13*12$	$=(C13*I13)*32$	$=(12-70)*C13*(E13+G13)$	$=M13-O13-Q13$
Example: Metal	55	69	80%	85%	0%	0%	20%	25%	44	59	\$ 2,208	\$ 552	\$ (3,402)	\$ 5,058
Brick/Masonry/Tile														
Building Materials*														
Carpet & Pad														
Cardboard														
Ceiling Tile														
Concrete														
Drywall														
Field Office Waste														
Paint														
Plastic Film, Sheeting, Wrap														
Scrap Metal														
Aluminum														
Copper														
Steel														
Other Metals														
Unpainted Wood/Pallets														
Window Glass														
Other (describe)														
Other (describe)														
Total									0	0.00	\$0.00	\$0	0	\$ 8,198

Cost to landfill = \$12/ton
 Cost to crush concrete/handle metal = \$6
 Cost to transport concrete/metal = \$11
 Cost of delivered gravel = \$13
 Revenue from sale of metal = \$70/ton

Note this is a negative **COST** as the revenue from the sale of the metal exceeds the cost (\$70/ton > \$12/ton), so it represents revenue, not a cost

* Doors, windows, fixtures, shingles, lumber, insulation, sheetgoods, etc.

Note: Contractor must transfer WMP Form A estimates to Form B to demonstrate the cumulative amount of waste generated and diverted.

Diversion percentages account for the amount and type of materials kept out of the landfill to date.

Attach proof of disposal or diversion. For example: haul tickets, landfill records, recycling receipts, bill of sale.

Contractor Signature: _____

Date: _____

Affidavit: _____

HCA Waste Management Plan - Form B

Start Date:

End Date:

Total # Months: _____

											Cost for Option 1	Cost for Option 2		
A	B	C	D	E	F	G	H	I	J	K	M	O	Q	S
Material	Generated Debris		Recycled Debris (%)		Salvage/ Reuse Debris (%)		Landfilled Debris (%)		Total Diverted Debris		Cost to Landfill All C&D Debris	Cost to Landfill Non-Diverted Material	Cost to Recycle, Salvage or Reuse	Total Savings (Cost of Option 1-2)
	Est (tons)	Actual	Est %	Actual %	Est %	Actual %	Est %	Actual %	Est (D+F) (tons)	Actual (E+G)	Actual \$/Ton	Actual %	Actual \$	Actual \$
Brick/Masonry/Tile														
Building Materials*														
Carpet & Pad														
Cardboard														
Ceiling Tile														
Concrete														
Drywall														
Field Office Waste														
Paint														
Plastic Film, Sheeting, Wrap														
Scrap Metal														
Aluminum														
Copper														
Steel														
Other Metals														
Unpainted Wood/Pallets														
Window Glass														
Other (describe)														
Other (describe)														
Total									0.00	0.00	\$0.00	\$0	0	\$0

TOTAL PROJECT SAVINGS \$ _____

* Doors, windows, fixtures, shingles, lumber, insulation, sheetgoods, etc.

Note: Contractor must transfer WMP Form A estimates to Form B to demonstrate the cumulative amount of waste generated and diverted.

Diversion percentages account for amount and type of materials kept out of the landfill to date.

Attach proof of disposal or diversion. For example: haul tickets, landfill records, recycling receipts, bill of sale.

Contractor Signature:

Date: _____ Affidavit: _____

**SECTION 01 7700
CLOSEOUT PROCEDURES**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

1.2 ACTION SUBMITTALS

- A. Contractor's Punch List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified Punch List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Before Substantial Completion: Complete the following minimum [$\leq$] [$\geq$] working days before requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
 - 5. Submit test/adjust/balance records.
- C. Procedures Before Substantial Completion: Complete the following minimum 10 working days before requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used before Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 7900.
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mock-ups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.6 FINAL COMPLETION PROCEDURES

- A. Submittals Before Final Completion: Before requesting final inspection for determining final completion, complete the following:
 1. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Organize list of spaces in sequential order, TBD.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Submit list of incomplete items in the following format:
 - a. PDF electronic file. Architect will return annotated file.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 working days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 1. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer recommendations.
- C. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - 1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - 2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - 3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - 4. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - 5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - 6. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - 7. Sweep concrete floors broom clean in unoccupied spaces.
 - 8. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - 9. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - 10. Remove labels that are not permanent.
 - 11. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - 12. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - 13. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - 14. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - a. Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - 15. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - 16. Leave Project clean and ready for occupancy.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section .

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.

- a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 8820
IMPACT RESISTANCE REQUIREMENTS**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for impact resistance of components and systems to be incorporated into the Work.
- B. Related Sections Include the Following:
 - 1. Division 01 Section "Submittal Procedures"
 - 2. Division 01 Section "Product Requirements" for substitutions of products or system which have been specified in the Contract Documents
 - 3. Division 02 through 49 Sections

1.2 IMPACT RESISTANCE

- A. This project is required to meet large and small missile impact requirements.
 - 1. Large missile impact requirements apply to construction units, assemblies and materials installed up to and including 30 feet above grade.
 - 2. Small missile impact requirements apply to construction units, assemblies and materials installed above 30 feet above grade.
 - 3. Each large and small impact test specimen shall be subjected to cyclic wind pressure loading as defined by Table 1626 of the Florida Building Code.

1.3 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. In order to provide adequate information to the Architect for proper review and evaluation of adequacy of products and systems, submit the following information with shop drawings and product data:
 - 1. Impact resistance certification approvals including any local agency approvals.
 - 2. Dimensions and details of each product, component, and system.

1.4 POSSIBLE BACK CHARGES TO CONTRACTOR

- A. If submittals for products or systems do not contain the data required, they will be returned without action for re-submission with required data. If the submittals are returned to Architect with incomplete or insufficient data, which may cause extra work to the Architect or its consultants, the Owner has the option to obtain reimbursement from the Contractor for costs incurred by the Owner for the Architect's services and expenses.

PART 2 -PRODUCTS – NOT USED

PART 3 -EXECUTION – NOT USED

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 01 9113
GENERAL COMMISSIONING REQUIREMENTS**

PART 1 - GENERAL

1.1 SCOPE

- A. Work under this Section is subject to requirements of the Contract Documents including Divisions 00 and 01.

1.2 DESCRIPTION

- A. Commissioning is a systematic process of ensuring the HVAC systems perform interactively according to the design intent and Owner's operational needs. Commissioning will encompass and coordinate traditionally separate functions of system documentation, installation checkout, equipment startup, control system calibration and point-to-point checkout, testing and balancing, and functional performance testing. Commissioning is intended to achieve the following specific objectives according to the Contract Documents:
1. Verify systems are in accordance with the plans and specifications.
 2. Verify and document proper installation and performance of equipment and systems.
 3. Ensure O&M, maintenance training, and commissioning documentation requirements are complete.
 4. Provide Owner with functional buildings and/or systems with minimal operational problems at time of move-in.
- B. Commissioning does not take away from or reduce responsibility of system designers or installing contractors to provide a finished and fully functioning product.
- C. This section shall in no way diminish the responsibility of the Division 23 Sub-contractors and Suppliers in performing all aspects of work and testing as outlined in the contract documents. Any requirements outlined in this section are in addition to requirements outlined in Division 23 Specifications.

1.3 ABBREVIATIONS

- A. The following are common abbreviations used in the Specifications. Definitions are found further in this Section.
1. A/E - Architect and Design Engineers – The HVAC Engineer
 2. BAS - Building Automation System
 3. CA - Commissioning Agent – An employee or agent of the GC
 4. CM - Construction Manager – HCA Construction Manager
 5. CT - Commissioning Team
 6. Cx - Commissioning
 7. CC - Controls Contractor
 8. DFM - HCA Director of Facility Management
 9. EC - Electrical Contractor
 10. FPT - Functional Performance Test
 11. GC - General Contractor
 12. MC - Mechanical Contractor
 13. OR - Owner's Representative
 14. PC - Pre-functional Checklist
 15. TAB - Test, Adjust and Balance
 16. O&M - Operations & Maintenance

17. RFI - Request for Information

1.4 RELATED WORK

- A. Specific commissioning requirements are given in the following sections of these specifications.

1.5 COORDINATION

- A. Commissioning Team: Members of the Commissioning Team (CT) will consist of:
1. Commissioning Agent (CA)
 2. Owner's Representative(s) (OR)
 3. Construction Manager (CM)
 4. Architect and Design Engineers (A/E)
 5. Mechanical Contractor (MC)
 6. Electrical Contractor (EC)
 7. Test and Balance Contractor (TAB Contractor)
 8. Controls Contractor (CC)
 9. Equipment Suppliers and Vendors
- B. Management: The CA directs and coordinates commissioning activities. All members of the Commissioning Team shall cooperate to fulfill contracted responsibilities and objectives of the Contract Documents.
- C. Kick-off Meeting: Within 90 days of commencement of construction, CA will plan, schedule and conduct a commissioning kick-off meeting. Membership and responsibilities of the commissioning team will be clarified at this meeting. CA will distribute meeting minutes to all parties.
- D. Scheduling:
1. CA will work with commissioning team to establish required commissioning activities to incorporate in preliminary commissioning schedule. The CA and GC will integrate commissioning activities into the master construction schedule. Representatives of the commissioning team will address scheduling problems. Necessary notifications are to be made in a timely manner in order to expedite commissioning.
 2. The CA will provide initial schedule of primary commissioning events at commissioning kick-off meeting. As construction progresses, more detailed schedules are developed by the CA.

1.6 DEFINITIONS

- A. Acceptance Phase: Phase of construction after startup and initial checkout when Functional Performance Tests, O&M documentation review and training occur.
- B. Approval: Acceptance that a piece of equipment or system has been properly installed and is functioning in tested modes according to the Contract Documents.
- C. Architect/Engineer (A/E): Prime consultant (architect) and sub-consultants who comprise the design team, generally HVAC Mechanical Designer/Engineer and Electrical Designer/Engineer.
- D. Commissioning Agent (CA): An assigned employee or agent of the GC. CA directs and coordinates day-to-day commissioning activities.
- E. Contract Documents: Documents binding on parties involved in construction of this project (drawings, specifications, change orders, amendments, contracts, etc.).
- F. Control System: System and components associated with building automation system.

- G. Construction Manager (CM): Owner's employee assigned the responsibility of managing the overall project.
- H. Deferred Functional Tests: Functional tests performed after substantial completion due to partial occupancy, equipment, seasonal requirements, design or other site conditions that disallow test from being performed.
- I. Deficiency: Condition of a component, piece of equipment or system that is not in compliance with Contract Documents (that is, does not perform properly or is not complying with design intent).
- J. Director of Facility Management (DFM): Facility employee responsible for the maintenance of the Physical Plant.
- K. Factory Testing: Testing of equipment on-site or at factory, by factory personnel.
- L. Functional Performance Test Procedures: Commissioning protocols and detailed test procedures and instructions that fully describe the steps required to determine if the system is performing and functioning properly. These procedures are written by the A/E and shall be used to document Functional Performance Tests. They shall be included in the Project Manual.
- M. Functional Performance Test (FPT): A demonstration of the dynamic function and operation of equipment and systems. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, life safety conditions, power failure, etc. Systems are run through all specified sequences of operation. Components are verified to be responding in accordance with contract documents. The test results are both manually recorded on the FPT Procedure and with trending data using the BAS. Functional Performance Tests are executed after pre-functional checklists and startups are complete.
- N. General Contractor: Contracted directly to Owner. Sub-contractors report to the General Contractor.
- O. Indirect Indicators: Indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100% closed.
- P. Manual Test: Using hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrary to analyzing monitored data taken over time to make "observation").
- Q. Monitoring: Recording of parameters (flow, current, status, pressure, etc.) of equipment operation using data loggers or trending capabilities of control systems.
- R. Non-Compliance: See Deficiency.
- S. Non-Conformance: See Deficiency.
- T. Overridden Value: Writing over a sensor value in the control system to see response of a system (e.g., changing outside air temperature value from 50°F to 75°F to verify economizer operation). See also "Simulated Signal".
- U. Owner's Representative (OR) – An employee of the Owner or person contracted with the Owner to provide Cx Verification Services. The responsibility of the OR is to assist the Cx Team in understanding the Cx requirements of the project, monitor the Cx progress through site visits and Cx Team Meetings, review the completed Cx Pre-Functional Performance Checklists and Functional Performance Test for completeness, perform Cx verification testing as appropriate to determine that the Cx requirements of the project have been successfully completed.
- V. Owner Verification: A repeat of the FPTs in the presence of the OR and A/E. The OR will determine if only selected or all FPTs will be repeated based on his inspection and review of the Cx documentation submitted by the CA prior to this visit. Typically the length of this visit is less than 3 days. On phased projects, phased commissioning may be required.

- W. Phased Commissioning: Commissioning completed in phases (by floors, for example) due to size of structure or other scheduling issues.
- X. Pre-functional Checklist (PC): 1) A list of static inspections and elementary component tests that verify proper installation of equipment (e.g., belt tension, oil levels, labels affixed, gages in place, sensors calibrated, etc.). 2) Pre-functional Checklists may also include startup tests that prepare equipment and system for functional operation. 3) A summary of specified documentation is presented in checklist format. The A/E shall include the PCs in the Project manual.
- Y. Seasonal Performance Tests: Functional Performance Tests or parts thereof that are deferred until system(s) ambient conditions are closer to design conditions in order to verify proper system operation.
- Z. Simulated Condition: Condition created for testing component or system (e.g., applying heat to space temperature sensor to monitor response of VAV box).
- AA. Simulated Signal: Disconnecting a sensor and using a signal generator or a software value to simulate an input value to the BAS.
- BB. Specifications: Construction specifications of Contract Documents.
- CC. Startup: The activities where systems or equipment are initially tested and operated. Startup is completed prior to functional testing.
- DD. Sub-contractor: Contractors of GC, and their sub-contractors, who provide and install building components and systems.
- EE. Test Procedures: Step-by-step processes, which must be executed to fulfill test requirements.
- FF. Test Requirements: Requirements specifying what modes and functions, etc. will be tested.
- GG. Trending: Recording of parameters (flow, temperature, pressure, status, etc.) during system operation using the BAS.
- HH. Vendor: Supplier of equipment.
- II. Warranty Period: Warranty period for entire project, including equipment components.

1.7 SUBMITTALS

- A. CA shall provide the OR and A/E an "as-built" controls submittal 5 working days prior to the scheduled Owner's Verification visit. The submittal shall include the full sequences of operation that describe the actual controls programming.

1.8 STARTUP

- A. Sub-contractor responsible for purchase, installation and startup of equipment shall perform the manufacturer's detailed startup and checkout procedures in addition to the PCs.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Division sub-contractors shall provide all specialized tools, test equipment and instruments required to execute startup, checkout and functional performance testing of equipment under their contract.

- B. Test equipment shall be of sufficient quality and accuracy to test and/or measure system performance with tolerances specified. A testing laboratory shall have calibrated test equipment within the previous 12 months. Calibration shall be NIST traceable. Equipment shall be calibrated according to manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 - EXECUTION

3.1 COMMISSIONING OVERVIEW

- A. The following provides a brief overview of typical commissioning tasks during construction and the general order in which they occur:
 - 1. Commissioning during construction begins with a kick-off meeting conducted by CA and OR where membership of commissioning team is established, responsibilities reviewed, and the Cx scope and procedures are reviewed.. A preliminary commissioning schedule is distributed for review.
 - 2. CA schedules subsequent meetings as necessary to plan, coordinate and schedule commissioning activities. Deficiencies and problem resolution will also be discussed at these meetings.
 - 3. CA develops, with cooperation of sub-contractor/vendor, detailed training plan. The CA schedules training activities with the facility's staff.
 - 4. CA assembles the Cx team and for a step by step review of the FPT procedures in advance of the execution of the first FPT. The A/E shall lead this review and immediately update any FPT that requires changes.
 - 5. A/E shall be present to assist in the execution of the first FPT. The CA shall coordinate the schedule for this test to coincide with the A/E's scheduled trip to attend an Owner-Architect-Contractor meeting.
 - 6. CA supervises the execution of the PCs. CA will witness startup of selected equipment.
 - 7. Functional testing is completed after TAB is completed.
 - 8. Functional Performance Tests are executed by sub-contractors, under supervision of and documented by CA.
 - 9. CA is responsible for having the completed FPT procedures, the specified trending data, the final T&B report, and the "as-built" control submittal to the OR and A/E not less than 5 working days prior to the scheduled Owner's Verification visit.
 - 10. All the FPTs must be completed and the Owner's Verification must occur prior to occupancy unless otherwise directed by the CM. (Owner Verification may be waived on some phases of a phased project; however, the FPTs and controls submittal must be submitted to the OR prior to occupancy.)
 - 11. Items of non-compliance in material, installation or setup will be corrected at sub-contractor expense and system shall be retested.

3.2 SYSTEMS TO BE COMMISSIONED

- A. Mechanical
 - 1. Air Handling Systems including air handlers, air terminal boxes, energy recovery systems, exhaust fans and ancillary equipment.
 - 2. Chilled Water System including chillers, cooling towers, pumps, and ancillary equipment.
 - 3. Steam System and components serving HVAC system.
 - 4. Heating Hot Water System including boilers, convertors, pumps and ancillary equipment.
 - 5. Building Automation System
- B. Plumbing: Domestic Hot Water Recirculation System
- C. Electrical: Emergency Generator

3.3 RESPONSIBILITIES

- A. Responsibilities of commissioning team members are:
 - 1. Architect/Engineer (A/E):
 - 2. Develop detailed PCs.
 - 3. Develop detailed project specific FPT procedures.
 - 4. Review FPTs in detail with the Cx Team.
 - 5. Witnesses first run of first FPT.
 - 6. Review all Cx documentation, including TAB reports, and provide written comments to the OR and CA within 5 days of receipt.
- B. Commissioning Agent (CA):
 - 1. Coordinate and direct commissioning activities in a logical, sequential and efficient manner.
 - 2. Schedule and chair Cx kick-off meeting and issue minutes.
 - 3. Provide progress reports of commissioning status.
 - 4. Periodically update commissioning schedule.
 - 5. Supervise completion of Pre-functional Checklists and supporting documentation to verify systems readiness for Functional Performance Testing.
 - 6. Supervise Functional Performance Tests. Document test results and recommend system for acceptance.
 - 7. Review completed TAB reports.
 - 8. Develop, with cooperation of sub-contractor/vendor and DFM, a detailed training plan.
 - 9. Schedule and oversee training sessions.
 - 10. Prepare final Commissioning Turnover Documentation.
 - 11. Facilitate cooperation of sub-contractors in commissioning work.
 - 12. Incorporate commissioning activities into master construction schedule.
 - 13. Schedule and chair all commissioning team meetings.
 - 14. Forward completed TAB report, as-built controls submittal, FPT procedure, and trend data to OR and A/E and at least 5 working days prior to scheduled Owner Verification visit.
 - 15. Identify, track and coordinate resolution of non-compliance and deficiencies identified by commissioning team. Maintain records of all issues submitted by commissioning team.
 - 16. Coordinate sub-contractor/vendor participation in training sessions. Provide workspace or conference room as needed. Ensure attendance at training is documented.
 - 17. Schedule, coordinate and assist CT in seasonal or deferred testing.
- C. Sub-contractors/Vendors:
 - 1. Review PCs and Functional Performance Test procedures.
 - 2. Ensure installation work is complete, is in compliance with Contract Documents and is ready for Functional Performance Testing.
 - 3. Execute Pre-functional Checklists and submit with supporting documentation to CA.
 - 4. Execute Functional Performance Tests developed by CA as described in contract documents.
 - 5. Provide certified and calibrated instrumentation required to take measurements of system and equipment performance during Functional Performance Testing.
 - 6. Assist CA with developing a comprehensive commissioning schedule.
 - 7. Attend commissioning kick-off meeting and other commissioning team meetings.
 - 8. Execute seasonal or deferred Functional Performance Testing.
 - 9. Make necessary amendments to O&M manuals and as-built drawings/submittals for applicable issues identified in the Cx process.
 - 10. Support the testing that occurs during the Owner's Verification visits.

- D. Controls Contractor (CC):
 - 1. Completely install and thoroughly inspect startup, test, adjust, calibrate and document systems and equipment under BAS Contract.
 - 2. Provide laptop computer, software and training to accommodate TAB Contractor in system balancing.
 - 3. Maintain database of control parameters submitted by TAB Contractor subsequent to field adjustments and measurements.
 - 4. Provide on-site technician skilled in software programming and hardware operation to exercise sequences of operation and to correct control deficiencies identified during Functional Performance Testing and Owner's Verification.
 - 5. Provide instrumentation, computer, software and communication resources necessary to demonstrate total operation of building systems during Functional Performance Testing and Owner's Verification of control system equipment.
 - 6. Attend commissioning kick-off meeting and other commissioning team meetings.
 - 7. Maintain comprehensive system calibration and checkout records. Submit records to CA upon request.
 - 8. Setup trend logs as requested by CA to substantiate proper systems operation.
 - 9. Prepare the required trending information and submit to the CA.
- E. Test, Adjust and Balance (TAB) Contractor:
 - 1. Attend commissioning kick-off meeting and other commissioning team meetings.
 - 2. Complete test and balance procedures prior to Owner's Verification visit.
 - 3. Cooperate with CC with execution of required work.
 - 4. Rebalance deficient areas identified during commissioning.
 - 5. Provide on-site technician, as necessary, skilled in TAB procedures to provide limited system TAB readings during Functional Performance Testing and Owner's Verification.

3.4 COMMISSIONING TEAM MEETINGS

- A. Commissioning team meetings will be held periodically as determined by CA with frequency increasing as construction advances and systems become operational. Attendance is mandatory. CA will record minutes and attendance. CA will chair Commissioning Team Meetings.
- B. Discussions held in Commissioning Team Meetings shall include, but not be limited to system/equipment startup, progress, scheduling, testing, documentation, deficiencies and problem resolution.

3.5 REPORTING

- A. CA will at OAC meetings provide regular status reports to CM and A/E.
- B. CA will regularly communicate with members of commissioning team, keeping them apprised of commissioning progress.
- C. CA shall submit non-compliance and deficiency reports to the CM.

3.6 STARTUP AND INITIAL CHECKOUT

- A. CA shall schedule equipment startup after the PCs are executed and documented by Sub-contractor. Startup shall not occur until after the CA and sub-contractors have reviewed the completed PCs.
- B. OR reserves the right to witness any startup or equipment testing. DFM shall be contacted and invited to witness all equipment startup.

- C. CA shall provide OR with signed and data copy of completed startup and pre-functional checklists. Only individuals having direct knowledge that a line item task was actually performed will initial or check that item off.
- D. CA shall clearly list outstanding items or initial startup and pre-functional procedures not completed successfully.
- E. CA shall review deficiency reports to determine if outstanding items prevent scheduling of Functional Performance Testing.

3.7 FUNCTIONAL PERFORMANCE TESTING

- A. Objectives and Scope:
 - 1. The objective of Functional Performance Testing is to demonstrate each system is operating according to documented design intent and Contract Documents. Functional Performance Testing facilitates bringing systems from a state of substantial completion to full dynamic operation. Additionally, during Functional Performance Testing, areas of deficient performance are identified and corrected, improving operation and functioning of systems.
 - 2. Each system shall be operated through all modes of operation where there is a specified system response. Verifying each sequence in the sequences of operation is required.
- B. Development of Test Procedures:
 - 1. The purpose of any given specific test is to verify and document compliance with stated criteria of acceptance given on test form. A/E shall develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Prior to execution, the CA will review the FPT procedures with the A/E and Cx Team (i.e. answering questions about equipment, operation, sequences, etc.). CA shall provide a copy of test procedures to Sub-contractor. Sub-contractor will review tests for feasibility, safety and equipment warranty protection. CA shall also submit tests to Owner, CM and A/E and other commissioning team members for review.
 - 2. Examples of test procedure forms to be developed by the A/E are included herein.
- C. Coordination and Scheduling:
 - 1. CA will conduct a step by step table top review of the FPT procedures with the CT weeks in advance of the first FPT.
 - 2. CA shall witness and document functional testing of equipment and systems. Sub-contractor shall execute tests under direction of CA.
 - 3. Functional Performance Testing is conducted after system operation and checkout is satisfactorily completed. Air balancing and water balancing is to be completed and debugged before functional testing of air-related or water-related equipment or systems.
 - 4. CA will schedule Owner's Verification visit with the OR and A/E.
 - 5. CA will transmit the completed FPT procedures, associated trend data, TAB report, and "as-built" control submittal to the OR and A/E on a schedule that will give them five working days to review this information prior to the scheduled Owner's Verification visit.

3.8 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

- A. Documentation: CA will witness and document the results of the FPTs using specific Functional Performance Test procedures developed for that purpose. CA will include filled out FPTs in Commissioning Turnover Package.
- B. Non-Conformance:
 - 1. CA will record results of functional performance testing. Deficiency or non-conformance issues will be noted and reported to A/E and OR on notes section of the FPT procedure.

2. Corrections of minor deficiencies identified may be made during tests at discretion of CA. In such cases, deficiency and resolution will be documented on FPT form.
 3. Every effort will be made to expedite testing and minimize unnecessary delays, while not compromising integrity of tests. CA shall not overlook deficient work or loosen acceptance criteria to satisfy scheduling or cost issues unless directed to do so by the OR.
 4. Deficiencies are handled in the following manner:
 - a. When there is no dispute on deficiency and Sub-contractor accepts responsibility for remedial action:
 - 1) CA documents deficiency.
 - 2) CA reschedules test with Sub-contractor.
 - b. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:
 - 1) CA documents deficiency and the sub-contractor's response and they go on to another test or sequence.
 - 2) CA facilitates resolution of deficiency. Other parties are brought into discussions as needed. Final interpretive authority is with A/E. Final acceptance authority is with the OR.
 - 3) CA documents the resolution.
- C. Approval: CA notes each satisfactorily demonstrated function on test form. CA, A/E and OR provide formal approval of FPT. CA recommends acceptance of each test to A/E and OR. The OR maintains a Cx Issues Log that documents the issues/problems that arise during Cx Verification. The OR and A/E work together to update the log until all the issues are resolved to the satisfaction of the OR. The OR notifies the CM when the Cx Issues are resolved to the extent that occupancy by the Owner can occur.

3.9 COMMISSIONING DOCUMENTATION

- A. Commissioning Turnover Package
1. CA is responsible to compile and organize commissioning records. CA shall deliver Cx records to the OR in Commissioning Binders. Turnover Package to include the following:
 - a. "As-built" controls submittal
 - b. Pre-functional Checklists
 - c. Completed Functional Performance Test records
 - d. Trend data
 - e. A list of deficiencies referenced to a specific FPT section
 - f. Final TAB Report

3.10 TRAINING OF OWNER PERSONNEL

- A. Sub-contractors will provide complete training in startup, operation and maintenance of all equipment under contract.
- B. CA will be responsible for overseeing and approving content and adequacy of Facility Staff training.
- C. Sub-contractor responsible for training will submit a written training plan to CA for review and approval prior to training. Plan will cover the following elements:
1. Equipment (included in training)
 2. Intended audience
 3. Location of training
 4. Objectives
 5. Subjects covered

6. Duration of training on each subject
 7. Instructor for each subject
 8. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
 9. Instructors and qualifications
- D. CA coordinates and schedules training with CM, DFM and Sub-contractors. CA develops criteria to determine training satisfactorily completed. CA schedules training sessions with appropriate personnel.
- E. CA will provide videotaping of training sessions as required.

3.11 DEFERRED TESTING

- A. Deferred Seasonal Testing: During warranty period, seasonal testing (tests delayed until weather conditions are closer to system's design) will be completed as part of this contract. CA will coordinate this activity. Tests will be executed, documented and deficiencies corrected by appropriate contractor(s), with DFM, OR and CA witnessing. CA will incorporate final updates to Commissioning Turnover Package as necessary.
- B. Unforeseen Deferred Tests: Any check or test not completed due to building structure, required occupancy condition, or other deficiency, may be delayed upon approval of OR. These tests will be rescheduled as soon as possible.

3.12 PRE-FUNCTIONAL CHECKLISTS

- A. The A/E shall include in the specifications Pre-functional Checklists for the major equipment in the systems under going Functional Performance Tests. Included at the end of this section are example Pre-functional Checklists. The design consultant is responsible for including in this section of the Project Manual comprehensive, accurate, and clearly written Pre-functional Checklists for the major equipment called for in the Project.
- B. The Mechanical Contractor's field foreman shall inspect each piece of installed HVAC equipment using the appropriate Pre-functional Checklist. He shall initial and date each item when it passes inspection and re-inspect until all items pass.
- C. When all items have successfully passed inspection the Mechanical Contractor's superintendent and the General Contractor's project manager shall separately inspect, sign and date the checklists to verify that the installation is complete.

3.13 FUNCTIONAL PERFORMANCE TESTS AND TEST PROCEDURES

- A. AHU Functional Performance Test – The AHU FPT is to be conducted after the hydronic water balance and air side T&B for the spaces served by the AHU are complete. Portions of this FPT also require that the chilled water and heating water systems operate to produce chilled water and heating water at design temperatures. The AHU FPT requires a 24 hour trend at 3 minute intervals of AHU and chilled water system parameters listed in the FPT procedure. The trending should be scheduled to ensure that fire alarm tests or other activities do not shut down the AHU or hydronic systems during the 24 hour period.
- B. In the Function Performance Tests Section (Tab 3) there is an example of AHU FPT (including templates for calculating and displaying the trend data) for the AHU sequence of operation contained in this document (see BAS AHU with and without Preheat Coil Schematic and Sequence of Operation Sections, Tabs 8 and 9). The design consultant is responsible for including in this section of the Project Manual a comprehensive, accurate, and clearly written AHU FPT that is specific to the sequence of operation specified.
- C. Air Terminal Unit Functional Performance Tests – Two tests are performed on the Air Terminal Units, a Heating Mode Test and a Cooling Mode Test. Completion of the AHU FPT is a prerequisite to performing

these tests. The VAV/CAV Air Terminal Unit Heating and Cooling tests are to be conducted after the hydronic water balance and air side T&B for the terminal units and the AHUs serving these units are completed. These FPTs also require that the chilled water and heating water systems produce design chilled water and heating water temperatures of typically 42°F and 180°F, respectively, continuously throughout the tests. Coordinate with other trades to insure that the chilled water, heating water, and AHUs involved will operate without interference throughout the duration of the tests, approximately 5 hours for each test. An effort should be made to keep all doors separating the terminal boxes' zones closed during these tests. The Air Terminal Unit FPT can be conducted simultaneously for all the terminal units in the project or selected terminal units may be tested separately from others provided the chilled water system, heating hot water system, and the AHU serving the units meet the prerequisites for conducting the test.

- D. The Heating Mode test is to be performed prior to the Cooling Mode test. The space thermostats involved in the Heating Mode test are to be set at 72°F at least 5 hours immediately prior to beginning the Heating Mode test. This is done to establish steady state temperature conditions prior to raising the space thermostats to a set point of 76°F.
- E. When the building has been given time to stabilize at 72°F begin trending the required parameters. Trend each data point every 3 minutes.
- F. Thirty minutes after beginning the trending of parameters globally change the thermostat set point of the boxes being tested to 76°F. Continue trending for another 5 hours. This completes the Heating Mode Test. The information requested on the Heating Mode Test form (see Functional Performance Test Procedures Section, Tab 3) is only supplied for terminal boxes that do not meet the test criteria specified at the bottom of the form.
- G. The Cooling Mode Test should immediately follow the Heating Mode Test. Globally set the thermostat set point of the boxes being tested to 69°F and continue trending the same parameters for 4½ hours.
- H. If the Cooling Mode Test does not immediately follow the Heating Mode Test, 5 hours prior to starting the Cooling Mode Test adjust the thermostat set point for the terminal units being tested to 74°F. After the 5 hour stabilization period, begin trending the parameters specified in the test form. Thirty minutes after beginning the trending, globally change the thermostat set point of the terminal units being tested to 69°F. Continue trending for another 5 hours.
- I. The trend data is to be presented as tabular data in an Excel workbook. The data for each terminal unit is to be contained in separate work sheets using the unique terminal unit designation as the name for each sheet. The columns of each work sheet are to be ordered from left to right as follows:
- J. Date and time in ascending order, zone thermostat set point, cooling set point, heating set point, actual zone temperature, terminal unit reheat coil discharge air temperature, reheat valve commanded position, actual cfm, heating cfm set point, cooling cfm set point, commanded damper position, AHU discharge air temperature, and heating hot water supply temperature. Shade data of the Heating Mode Test red and the Cooling Mode Test data blue.
- K. The system trend data, AHU discharge air temperature, chilled water valve control position, building chilled water supply temperature, building heating hot water supply temperature, and outside air temperature are to be combined in a separate worksheet for each AHU.
- L. Heating Mode and Cooling Mode test forms and templates for calculating and displaying the trend data are included in the Functional Performance Tests Section (Tab 3). These sheets are to be completed for the terminal units that fail the initial FTP or any subsequent FPT.
- M. Chilled Water System Functional Performance Test – The Chilled Water System FPT is conducted after chiller startup, hydronic TAB, and the AHU chilled water control valves are under automatic control. This FPT must test or demonstrate: user change of the order in which the chillers are staged; automatic start of the lead chiller; automatic start of the lag chillers in sequence; automatic de-staging of the lag chillers in

sequence; automatic staging and control of pumps and pump speeds; the ability of the system to maintain minimum chiller flow; calibration of the chilled water system sensors.

- N. In the Function Performance Tests Section (Tab 3) there is an example of a Primary/Secondary Chilled Water System FPT. The design consultant is responsible for including in this section of the Project Manual a comprehensive, accurate, and clearly written Chilled Water System FPT that is specific to the sequence of operation specified.
- O. BAS/ESC connectivity Functional Performance Test – Coordinate with HCA corporate Facilities Group Energy Service center to verify full BAS communication between the facility and ESC.
- P. Pre-Functional Checklists:
1. Air Terminal Unit Pre Functional Checklist
 2. General Exhaust Fan Pre-Functional Checklist
 3. Piping and Ductwork Pre Functional Checklist
 4. Rooftop Unit Pre-Functional Checklist
- Q. Functional Performance Test Procedures:
1. Air Handling Unit Functional Performance Test
 2. Air Terminal Unit Heating and Cooling Functional Performance Test
 3. BAS Graphics Programmers' Guide
 4. General Exhaust Fan Functional Performance Test
 5. Isolation Rooms Functional Performance Test
 6. VAV Trend Data

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

AIR TERMINAL UNIT PRE-FUNCTIONAL CHECKLIST

[Insert Your Logo Here] [Vendor Logo Here]

Facility Name:	Date:
Project Name:	
Served by AHU #:	
VAV #:	

General	Y/N/NA; Initials; Date
1 Box is hung from structure with 4 support wires supplied by manufacturer.	
2 Transition to box inlet allows for minimum 2 duct diameters of straight, hard duct entering box, no flex allowed.	
3 Duct run out matches duct size on drawings.	
4 Duct run out from main line greater than 15 feet is 1 size larger than inlet of VAV.	
5 Piping package is installed and accessible with isolation valves and union for service.	
6 Hot water return and air bleed are installed at top of coil.	
7 Hot water piping is not installed above air bleed valve.	
8 Piping is properly supported within 3 feet of box.	
9 Power is connected to unit.	
10 Required access is provided for control box for service.	
11 Discharge air temperature sensor is installed downstream of unit.	
12 Controls wiring and sensors are installed and complete.	
13 Piping insulation is complete and undamaged.	
14 Duct insulation is complete and undamaged.	
15 Units concealed above lay-in ceilings are marked by a marker clipped to the grid.	
16 Unit is labeled.	

Notes	Date
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Approvals

Mechanical Contractor / Signature

Company:

General Contractor / Signature

Company:

[Insert Your Logo Here] [Vendor Logo Here]

General Exhaust Fan Pre-Functional Checklist

Facility Name:		Date:	
Project Name:			
EF #:			

1	Manufacturer:	
2	Model #:	

General		Y/N/NA; Initials; Date
3	Unit is securely mounted on roof curb	
4	Access is provided to service the fan	
5	Birdscreen is installed	
6	Fan is installed to avoid re-entrainment of exhaust air back into facility	
7	Unit is permanently labeled	
8	Unit is clean	

Electrical/Controls		Y/N/NA; Initials; Date
9	Power is connected to unit	
10	Disconnect is installed and located within sight of fan	
11	Controls wiring and sensors are installed and complete	

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Approvals

Mechanical Contractor / Signature

Company:

General Contractor / Signature

Company:

Piping and Ductwork Pre-Functional Checklist

[Insert Your Logo Here] [Vendor Logo Here]

Facility Name: _____

Date: _____

Project Name: _____

1 Manufacturer: _____

2 Model #: _____

Chilled Water Piping

Y/N/NA; Initials; Date

Piping in mechanical rooms are painted and labeled identifying contents and flow direction
Piping is labeled in 20 foot intervals and at least once in each separate space
Pipe is supported properly per the contract documents
Sleeves are installed on piping passing through masonry walls and floors
Air separator and expansion tank are installed and piped
Expansion tank has been properly charged
Air vents are provided at high points throughout the system
Drain valves are provided at low points throughout the system
Shutoff valves are installed at main branches on each floor or major wings or sections
CHW piping is insulated with closed-cell type and undamaged
System has been cleaned and flushed

Heating Hot Water Piping

Y/N/NA; Initials; Date

Piping in mechanical rooms are painted and labeled identifying contents and flow direction
Piping is labeled in 20 foot intervals and at least once in each separate space
Pipe is supported properly per the contract documents
Sleeves are installed on piping passing through masonry walls and floors
Air separator and expansion tank are installed and piped
Expansion tank has been properly charged
Air vents are provided at high points throughout the system
Drain valves are provided at low points throughout the system
Shutoff valves are installed at main branches on each floor or major wings or sections
HW piping is insulated with molded fiberglass and undamaged
Piping 2" and larger are supported with high density insulation inserts and not wood blocks
System has been cleaned and flushed

Steam Piping

Y/N/NA; Initials; Date

Piping in mechanical rooms are painted and labeled identifying contents, flow direction, and working pressure
Piping is labeled in 20 foot intervals and at least once in each separate space
Pipe is supported properly per the contract documents
Sleeves are installed on piping passing through masonry walls and floors
Shutoff valves are installed at main branches on each floor or major wings or sections
Steam piping is insulated with molded fiberglass and undamaged
Piping 2" and larger are supported with high density insulation inserts and not wood blocks

Condensate Piping

Y/N/NA; Initials; Date

Piping in mechanical rooms are painted and labeled identifying contents and flow direction
Piping is labeled in 20 foot intervals and at least once in each separate space
Pipe is supported properly per the contract documents
Sleeves are installed on piping passing through masonry walls and floors
Condensate piping is insulated with molded fiberglass and undamaged
Piping 2" and larger are supported with high density insulation inserts and not wood blocks

Ductwork

Y/N/NA; Initials; Date

Duct is properly supported per the contract documents
Mechanical room duct floor penetrations and plenum floor penetrations are installed with 2" curb
Duct insulation is complete and undamaged

[Insert Your Logo Here] [Vendor Logo Here]

Piping and Ductwork Pre-Functional Checklist

Notes		Date
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Approvals

Mechanical Contractor / Signature

Company:

General Contractor / Signature

Company:

[Insert Your Logo Here] [Vendor Logo Here]

Rooftop Unit Pre-Functional Checklist

Facility Name:

Project Name:

RTU #:

Date:

1 Manufacturer:

2 Model #:

General		Y/N/NA; Initials; Date
3	Unit is installed on spring vibration isolation roof curb	
5	Access doors open freely and seal tightly	
6	Lights are provided and controlled off timer switch	
7	Viewable windows are provided in access doors at filters, fans, and humidifier sections	
8	Outside air intake is minimum 36" above roof	
	Outside air intake is minimum 25 feet from sanitary vent or exhaust	
	Lightning protection installed and terminated	
9	Dampers are low leakage and installed with rubber gasket	
10	Duct smoke detectors are installed in supply and return ductwork with required access doors	
	All pipe penetrations through roof are sealed	
11	Fire/Smoke dampers are installed with access doors where specified	
12	Unit is clean	

Chilled Water Coil		Y/N/NA; Initials; Date
	Piping valves and accessories are installed at unit	
13	Isolation valves are installed on supply and return piping for service	
14	Piping is properly supported and not supported by the coil	
15	Flanges/Unions are provided at coil connections for access	
16	Access is provided for coil pull without obstructions	
17	Clearances have been maintained and piping is installed for service	
18	Coil drain with valve is installed at low point of coil	
19	Manual air vent is installed at high point in coil	
21	PT Ports are installed on supply and return piping directly at coil connection and at all temperature sensors	
22	Balancing valve is installed in return piping with recommended straight length upstream and downstream of valve	
23	Control valve is installed in the return piping	
24	Common glycerin filled pressure gauge is installed across coil with shutoff valve installed on each line	
25	Weiss solar digital thermometers are installed in common supply and return piping to/from coils and viewable from floor	
26	Temperature sensor is installed in return piping	
27	Coils are clean and fins are in good condition	
28	Temporary flushing connection is installed with valves to bypass coil during flushing	
29	Coil is piped counterflow (coldest water to coldest air)	
30	Control wells are installed	

Condensate Piping		Y/N/NA; Initials; Date
31	Stainless steel drain pan is sloped to drain	
32	Condensate drain is full line size with union	
33	Condensate drain is installed with clean out plug at tee	
34	Open vent is installed after trap	
35	Total trap height between drain pan and condensate after trap is Total Static Pressure + 1"	
36	Total trap height between drain pan and bottom of trap is 2 * (Total Static Pressure + 1")	
37	Condensate drain is piped to nearest roof drain with air gap	

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Rooftop Unit Pre-Functional Checklist

Secondary Cooling Coil		Y/N/NA; Initials; Date
	Piping valves and accessories are installed at unit	
38	Isolation valves are installed on supply and return piping for service	
39	Piping is properly supported and not supported by the coil	
40	Flanges/Unions are provided at coil connections for access	
41	Access is provided for coil pull without obstructions	
42	Clearances have been maintained and piping is installed for service	
43	Coil drain with valve is installed at low point of coil	
44	Manual air vent is installed at high point in coil	
46	PT Ports are installed on supply and return piping directly at coil connection and at all temperature sensors	
47	Balancing valve is installed in return piping with recommended straight length upstream and downstream of valve	
48	Control valve is installed in the return piping	
49	Common glycerin filled pressure gauge is installed across coil with shutoff valve installed on each line	
50	Weiss solar digital thermometers are installed in common supply and return piping to/from coils and viewable from floor	
51	Temperature sensor is installed in return piping	
52	Coils are clean and fins are in good condition	
53	Temporary flushing connection is installed with valves to bypass coil during flushing	
54	Coil is piped counterflow (coldest water to coldest air)	
55	Control wells are installed	

Heating Hot Water Coil		Y/N/NA; Initials; Date
	Piping valves and accessories are installed at unit	
56	Isolation valves are installed on supply and return piping for service	
57	Flanges/Unions are provided at coil connections for access	
58	Access is provided for coil pull without obstructions	
59	Piping is properly supported and not supported by the coil	
60	Coil drain with valve is installed at low point of coil	
61	Manual air vent is installed at high point in coil	
63	PT Ports are installed on supply and return piping directly at coil connection and at all temperature sensors	
64	Weiss solar digital thermometers are installed in common supply and return piping to/from coils and viewable from floor	
65	Balancing valve is installed in return piping with recommended straight length upstream and downstream of valve	
66	Control valve is installed in the return piping	
67	Isolation valves are installed across recirculation pump	
68	Check valve is installed on discharge of recirculation pump	
69	Glycerin filled pressure gauges are installed across recirculation pump	
70	Recirculation pump is installed with differential pressure switch across pump to indicate status to BAS	

Steam Pre-Heat Coil		Y/N/NA; Initials; Date
71	Isolation valve is installed on supply piping for service	
72	Flanges/Unions are provided at coil connections for access	
73	Access is provided for coil pull without obstructions	
74	Piping is properly supported and not supported by the coil	
75	Dirt leg is installed with condensate trap on steam piping to coil	
76	Control valve is installed not to allow the buildup of condensate and is accessible	
77	Condensate trap is installed with shutoff valves and unions for service	
78	Condensate piping slopes down from coil and does not lift	
79	Vacuum breaker is installed in coil	

[Insert Your Logo Here] [Vendor Logo Here]

Rooftop Unit Pre-Functional Checklist

Humidifier		Y/N/NA; Initials; Date
80	Isolation valve is installed on supply piping for service	
81	Flanges/Unions are provided at coil connections for access	
82	Access is provided for tube removal without obstructions	
83	Piping is properly supported and not supported by the humidifier	
84	Control valve is installed not to allow the buildup of condensate and is accessible	
85	Humidifier is located a minimum 15 feet upstream of final filters or downstream of final filters and smoke detectors	
86	Viewable window and light is provided to observe operation	
87	Controlling high limit humidity sensor is installed downstream of humidifier	
88	High limit humidity switch is installed adjacent to the controlling high limit humidity sensor	
89	Condensate trap is installed with shutoff valves and unions for service	
90	Condensate piping slopes down from coil and does not lift	

Supply Fan		Y/N/NA; Initials; Date
	Fan is installed on 2" static deflection spring isolators and not bottomed out	
	Torque springs are properly installed on fan	
	Shipping bolts have been removed from spring isolators	
	Piezometer ring properly installed for air flow measuring station with proper transducer	
	Fan guard is properly installed	
	High static pressure safety switch is installed in proper location and manual reset is accessible	
	Flexible connection is provided at fan and duct connections	
	Starter/VFD is installed and permanently labeled	
	Bearings lubricated on fans and shaft. Grease Zerks are readily accessible	

Return Fan		Y/N/NA; Initials; Date
	Fan is installed on 2" static deflection spring isolators and not bottomed out	
	Torque springs are properly installed on fan	
	Shipping bolts have been removed from spring isolators	
	Piezometer ring properly installed for air flow measuring station with proper transducer	
	Fan guard is properly installed	
	High static pressure safety switch is installed in proper location and manual reset is accessible	
	Flexible connection is provided at fan and duct connections	
	Starter/VFD is installed and permanently labeled	
	Bearings lubricated on fans and shaft. Grease Zerks are readily accessible	

Filter Sections		Y/N/NA; Initials; Date
	Filter racks are front loading	
	Manometers are installed and have clean and dirty markings on gauge	
	Pre and final filters are installed prior to equipment startup	

Electrical/Controls		Y/N/NA; Initials; Date
	Power is connected to unit	
	Control and electrical panel clearances are provided	
	Return temperature sensor is installed in return ductwork	
	Return humidity sensor is installed in return ductwork	
	Mixed Air temperature sensor is installed 1 linear foot for each square foot of coil area	
	Freezestat sensors are installed 1 linear foot for each square foot of coil area	
	Adequate space between coil and temperature sensor is allowed for coil cleaning without removing capillary tube	
	Pre-Heat coil temperature sensor is installed downstream of pre-heat coil	
	Duct static pressure sensor is installed in proper location	
	Discharge air temperature sensor is installed downstream of coils	
	Air Flow Measuring Station display is in accessible location	
	All dampers and actuators are installed per construction documents	
	Filter switch is installed across pre and final filter bank	
	Controls wiring and sensors are installed and complete	

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Rooftop Unit Pre-Functional Checklist

Insulation & Labeling		Y/N/NA; Initials; Date
	Piping insulation is complete and undamaged	
	Duct insulation is complete and undamaged	
	Outdoor piping is insulated and heat traced	
	Engraved label for unit is installed and clearly visible	
	Piping is labeled with contents and flow direction	
	Valves are tagged with permanent engraved labels	

Start-Up		Y/N/NA; Initials; Date
	Flushing of piping is complete and flushing connection lines are removed, capped, and valve handles removed prior to start-up	
	Unit and all ductwork are protected prior to being used for temporary conditioning of space	
	Factory representative start-up completed and documents provided	

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Approvals

Mechanical Contractor / Signature

Company:

General Contractor / Signature

Company:

[Insert Your Logo Here] [Vendor Logo Here]

Air Handling Unit Functional Performance Test

Reference		Date		AHU #	

Unit Configuration and Basic Design Information

Instructions:

- Answer Yes or No for each component that is present for this unit.
- Use Plan CFMs and VAV Totals for the following information.

Component	Y	N	Plan CFMs/VAV Totals
Economizer Package			
Air Blender			Unit Design CFM when all VAV terminals are at full cooling.
Return Fan			
Pre-Heat Coil			Unit Design CFM when all VAV terminals are at minimum.
Humidifier			
CHW Coil			Design Outside Air CFM.
Glycol Coil			
Supply Fan			

Notes:

1 Start of Test Readings

Instructions: BAS contractor to record the following controls system point readings to document status of unit at the beginning of test.

Sensor/Input Readings	Actuator/Output Positions
Outside Air Temperature	Minimum OA Damper Position
Outside Air Humidity	Economizer OA Damper Position
Return Air Temperature	Return Air Damper Position
Return Air Humidity Setpoint	Relief Air Damper Position
Return Air Humidity	Pre-heat Valve Position
Mixed Air Temperature	Humidifier Valve Position
Preheat Discharge Air Temperature Setpoint	Chilled Water Valve Position
Preheat Discharge Air Temperature	Supply Fan Speed
Discharge Air Temperature Setpoint	Return Fan Speed
Discharge Air Temperature	
Duct Static Pressure Setpoint	
Duct Static Pressure	
Supply CFM	
Return CFM	
Outside Air CFM Setpoint	
Outside Air CFM Actual	

Notes:

2 Control Valve Test

2a. Chilled Water Valve (s)

Verify Chilled water system is operating and under control. ☐ Y/N

Test Procedure: Command CHW Valve closed (0%)

Using Micro manometer, Measure Coil Water differential pressure. ☐ In. W.G.
CHW Valve is closed with no water flow. ☐ Y/N

Test Procedure: Command CHW Valve open to 5%

Using Micro manometer, Measure Coil Water differential pressure. ☐ In. W.G.
Does coil ΔP indicate coil flow is present? ☐ Y/N

Test Procedure: If no, Command CHW Valve open in 2% increments until water flow

Using Micro manometer, Measure Coil Water differential pressure. ☐ In. W.G.
Record BAS command when water flow starts. ☐ %
Value less than 15%? ☐ Y/N

Test Procedure: Command CHW Valve to 90%

	Test Procedure: Command CHW Valve to 100% open	Verify valve motion to 90%. Y/N Verify valve fully opens. Y/N
Notes:		
2b. Hot Water Valve		
	Test Procedure: Command HW Valve closed (0%)	Verify hot water system is operating and under control. Y/N Using Micro manometer, Measure Coil Water differential pressure In. W.G. HW Valve is closed with no water flow. Y/N
	Test Procedure: Command HW Valve open to 5%	Using Micro manometer, Measure Coil Water differential pressure In. W.G. Does coil ΔP indicate coil flow is present? Y/N
	Test Procedures: If no, Command HW Valve open in 2% increments until water flow	Using Micro manometer, Measure Coil Water differential pressure In. W.G. Record BAS command when water flow starts. % Is value less than 15%? Y/N
	Test Procedure: Command HW Valve to 90% & verify valve motion	Verify valve motion to 90%. Y/N
	Test Procedure: Command HW Valve to 100% open & verify valve fully open	Verify valve fully opens. Y/N
Notes:		
2c. Recirculation Pump		
	Test Procedure: Simulate OAT to 40°F	Recirculation pump energizes. Y/N BAS pump status shows on. Y/N Measure Preheat Coil ΔP In W.G.
	Test Procedure: Simulate OAT > 42°F	Recirculation pump stops. Y/N BAS pump status shows off. Y/N
Notes:		
2d. Humidifier Valve		
		Verify Steam system is operating and under control. Y/N Record Steam Pressure PSI
	Test Procedure: Command valve closed (0%)	Verify valve closed. Y/N
	Test Procedure: Command valve 5% open	Verify stem starts to open. Y/N
	Test Procedures: If No, open valve in 2% increments	Record when valve starts to move. % Value was less than 15%? Y/N
	Test Procedure: Command valve to 90% open	Verify valve opens. Y/N
	Test Procedure: Command valve to 100% open	Verify valve opens 100%. Y/N Release all valve overrides. Y/N
Notes:		

Air Handling Unit Functional Performance Test

[Insert Your Logo Here] [Vendor Logo Here]

3	Damper Binding Test		
	Test Procedure: Command VAV terminals served by this AHU to 100% design cooling CFM		
3a.	Minimum Outside Air Damper		
	Test Procedure: Command minimum OA damper closed	Verify damper closed tightly.	Y/N
	Test Procedure: Command minimum OA damper open	Verify actuator and blades of damper open fully.	Y/N
	Notes:		
3b.	Economizer Dampers		
	Test Procedure: Command economizer OA damper to 50% open		
	Verify actuator and blades of OA damper are approximately 50% open.		Y/N
	Verify actuator and blades of relief damper are approximately 50% open.		Y/N
	Verify actuator and blades of return damper are approximately 50% open.		Y/N
	Test Procedure: Command economizer OA damper to 90% open		
	Verify actuator and blades of OA damper are approximately 90% open.		Y/N
	Verify actuator and blades of relief damper are approximately 90% open.		Y/N
	Verify actuator and blades of return damper is approximately 90% closed.		Y/N
	Test Procedure: Command economizer OA damper to 100% open		
	Verify actuator and blades of OA damper are 100% open.		Y/N
	Verify actuator and blades of relief damper are 100% open.		Y/N
	Verify actuator and blades of return damper are 100% closed and closed tightly.		Y/N
	Release all damper overrides.		Y/N
	Notes:		

4	Static Pressure Controller		
4a.	Record location of static pressure sensor:		
	Is pressure being sensed in area being served by the AHU?		Y/N
4b.	Record TAB recommended set point necessary to satisfy worse case air terminal.		In. W.G.
	<i>List in notes below box(es) that determine set point.</i>		
4c.	Test Procedure: Set static SP to recommended value. Command VAVs to Design Full Cooling CFM.		
	Verify calibration of sensor by comparison to TAB contractors test instrument measuring pressure between same locations as sensor.		Y/N
	Record BAS static pressure reading.		In. W.G.
	Record TAB static pressure reading.		In. W.G.
	Readings are within specified tolerance.		Y/N
4d.	Test Procedure: Adjust setpoint down 0.4" below current setpoint.		
	Verify supply fan modulates down to meet new SP.		Y/N
	Record New Set Point.		In. W.G.
	Set static SP to TAB recommended value .		Y/N
	Notes:		

5	AFMS - Fan Inlet Probes Type		
5a.	Fan Information		
	Supply Fan Information		
	Supply Fan: Record fan inlet cone area.		ft ²
	Supply Fan: Record less fan shaft where applicable.		ft ²
	Supply Fan: Record flow area.		ft ²
	Return Fan Information		
	Return Fan: Record fan inlet cone area.		ft ²
	Return Fan: Record less fan shaft where applicable.		ft ²
	Return Fan: Record flow area.		ft ²
5b.	Verify Pargon transmitter air temperature settings		
	Verify Paragon transmitter air temperature setting for return air is 73°F.		Y/N

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Verify Paragon transmitter air temperature setting for supply air is 55°F.			Y/N	
5c.	Test Procedure: Command VAV terminals served by this AHU to 100% design cooling CFM. Manually control speed of supply fan until its AFMS reads approximately design CFM. Traverse supply and return ducts.	Record supply fan BAS reading.		CFM
		Record supply fan traverse reading.		CFM
		Record return fan BAS reading.		CFM
		Record return fan traverse reading.		CFM
		Record the total air terminals supply air CFM from BAS.		CFM
Notes:				

6 Sensor Calibration						
6a.	Test Procedure: Close minimum OA, economizer OA, and relief dampers and open return damper 100%. Shut off pre-heat, CHW, and humidifier valves. Set OA CFM SP to 0 CFM. Command VAV boxes to full design CFM.					
6b.	Test Procedure: Slowly ramp up supply fan speed until return fan is almost unable to maintain a steady 0 CFM SP.					
Verify no air is leaking through the closed OA & relief dampers.			Y/N			
6c.	Test Procedure: Compare sensor readings against TAB contractor test instrument measuring temperature or humidity at same location as sensor (Tolerance - +/- 0.5°F & +/- 5% RH)		BAS Readings	TAB Reading		
		Return Air Temperature		°F		°F
		Sensor within tolerance?		Y/N		
		Mixed Air Temperature		°F		°F
		Sensor within tolerance?		Y/N		
		Pre-Heat Air Temperature		°F		°F
		Sensor within tolerance?		Y/N		
		Discharge Air Temperature		°F		°F
		Sensor within tolerance?		Y/N		
		Return Air Humidity		°F		°F
		Sensor within tolerance?		Y/N		
		Supply Air High Limit Humidity		°F		°F
		Sensor within tolerance?		Y/N		
		Outside Air Temperature		°F		°F
		Sensor within tolerance?		Y/N		
Outside Air Humidity		% RH		% RH		
Sensor within tolerance?		Y/N				
Notes:						

7 SF and RF Airflow Measuring Device Synchronization and Calibration			
7a.	Test Procedure: With unit still in zero outside air mode (as above) and VAV boxes in full cooling, Command RF speed until micrometer readings of the mixed air plenum pressure stay within +/- 0.009" w.c. range.		
	Record BAS box total.		CFM
	Record BAS supply fan CFM.		CFM
	Record BAS return fan CFM.		CFM
	Record Supply Fan CFM - Return Fan CFM (difference).		CFM
	Is difference greater than 5% of total airflow?		Y/N
7b.	If yes, recalibrate one AFMS to equal other AFMS. Use AFMS that more closely matches box total as standard or more accurate traverse.		
	After calibration: Record supply fan CFM.		CFM
	After calibration: Record return fan CFM.		CFM
	Record Supply Fan CFM - Return Fan CFM (Difference).		CFM
	Record which AFMS was recalibrated.		SF/RF
	Record Supply AFMS calibration factor.		
	Record Return AFMS calibration factor.		
7c.	Return AHU to normal operation and release all overrides.		
Notes:			

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Air Handling Unit Functional Performance Test

8 Return Fan Minimum Outside Air CFM
8a. Test Procedure: Command unit to Minimum OA Mode and VAV boxes to Design Full Cooling CFM.
Supply fan modulates to maintain duct static pressure SP. Return fan modulates to maintain CFM offset SP. Set OA CFM offset to correct SP and record SP. Return fan modulates to maintain CFM offset SP. Record supply duct static pressure reading. Record supply fan speed and hertz. Record supply CFM per AFMS. Record return fan speed and hertz. Record return CFM per AFMS. Record Outside Air CFM (SF-RF). Y/N CFM in. W.G. %/Hz CFM %/Hz CFM CFM
8b. Test Procedure: Command AHU to 100% economizer mode.
Return fan modulates to maintain CFM offset SP. Record supply duct static pressure reading. Record supply fan speed and hertz. Record supply CFM per AFMS. Record Outside Air CFM (SF-RF). Y/N In. W.G. %/Hz CFM CFM
8c. Test Procedure: Command all VAV boxes served by this AHU to minimum CFM setting.
Return fan modulates to maintain CFM offset SP. Record supply duct static pressure reading. Record supply fan speed and hertz. Record supply CFM per AFMS. Record return fan speed and hertz. Record return CFM per AFMS. Record Outside Air CFM (SF-RF). Y/N In. W.G. %/Hz CFM %/Hz CFM CFM
8d. Test Procedure: Command AHU to minimum OA Mode at minimum CFM.
Return fan modulates to maintain CFM offset SP. Record supply duct static pressure reading. Record supply fan speed and hertz. Record supply CFM per AFMS. Record return fan speed and hertz. Record return CFM per AFMS. Record Outside Air CFM (SF-RF). Y/N In. W.G. %/Hz CFM %/Hz CFM CFM
8e. Test Procedure: Turn off supply and return fan.
Supply fan CFM < 50 CFM Return fan CFM < 50 CFM Y/N Y/N
8f. Return AHU to normal operation and release all overrides.
Notes:

9 Manual Reset Freeze Stat / Low Temp Detection		
9a. Verify Freezestat is set at 36°F.		Y/N
9b. Test Procedure: Use ice bag to activate low temperature/freezestat.		
Verify supply fan shuts down. Verify return fan shuts down. Verify associated exhaust fans shut down. Verify low temperature alarm is initiated at BAS. Verify economizer OA damper is closed. Verify minimum OA damper is closed. Verify relief OA damper is closed. Verify return OA damper is open. Verify CHW valve opens. Verify pre-heat recirculation pump energizes. Verify secondary CHW pump is energized at plant. Y/N Y/N Y/N Y/N Y/N Y/N Y/N Y/N Y/N Y/N		
9c. Test Procedure: If Pre-heat coil; Simulate pre-heat leaving air temperature to 41°F and outside air temperature to 40°F.		

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Air Handling Unit Functional Performance Test

	Verify pre-heat valve opens.		Y/N
	Verify pre-heat recirculation pump energizes.		Y/N
9d.	Return AHU to normal operation and release all overrides.		
Notes:			

10	High Static Safety Switch and Dirty Final Filter Alarm		
10a.	Record high static safety switch setting approved by Design Consultant.		in. W.G.
10b.	Test Procedure: With fan running, trip high static safety switch with squeeze bulb and magnahelic gauge. Adjust setting as required to trip at recorded setting above.		
	Record high static safety switch setting after adjustment.		In. W.G.
	Verify AHU supply fan, return fan, and associated Efs shut down.		Y/N
	Verify AHU economizer, minimum OA, and relief dampers modulate closed.		Y/N
	Verify return damper modulates fully open.		Y/N
	Verify CHW valve and humidifier valve close.		Y/N
	Verify pre-heat valve is active to maintain pre-heat temperature setpoint.		Y/N
	Record actual switch setpoint adjacent to switch on AHU casing with black permanent marker.		Y/N
	Record dirty pressure drop setpoint for final filter (consult submittal and filter schedule).		In. W.G.
10c.	Test Procedure: With fan running, trip dirty filter switch with squeeze bulb and magnahelic gauge. Adjust setting as required to trip at recorded setting above.		
	Record dirty pressure drop setpoint after adjustment.		In. W.G.
	Verify dirty final filter alarm was generated at BAS.		Y/N
10d.	Test Procedure: Reset dirty filter alarm.		
	Verify alarm clears on BAS.		Y/N
	Verify dirty filter setpoint is marked on pressure gauge.		Y/N
Notes:			

11	LOW Static Safety Switch and Dirty Pre-Filter Alarm		
11a.	Record low static safety switch setting approved by Design Consultant.		in. W.G.
11b.	Test Procedure: With fan running, trip low static safety switch with squeeze bulb and magnahelic gauge. Adjust setting as required to trip at recorded setting above.		
	Record low static safety switch setting after adjustment.		In. W.G.
	Verify AHU supply fan, return fan, and associated Efs shut down.		Y/N
	Verify AHU economizer, minimum OA, and relief dampers modulate closed.		Y/N
	Verify return damper modulates fully open.		Y/N
	Verify CHW valve and humidifier valve close.		Y/N
	Verify pre-heat valve is active to maintain pre-heat temperature setpoint.		Y/N
	Record actual switch setpoint adjacent to switch on AHU casing with black permanent marker.		Y/N
	Record dirty pressure drop setpoint for final filter (consult submittal and filter schedule).		In. W.G.
11c.	Test Procedure: With fan running, trip dirty filter switch with squeeze bulb and magnahelic gauge. Adjust setting as required to trip at recorded setting above.		
	Record dirty pressure drop setpoint after adjustment.		In. W.G.
	Verify dirty final filter alarm was generated at BAS.		Y/N
11d.	Test Procedure: Reset dirty filter alarm.		
	Verify alarm clears on BAS.		Y/N
	Verify dirty filter setpoint is marked on pressure gauge.		Y/N
Notes:			

12	Economizer Mode Operation		
	Caution: This portion of the functional Performance Test (FPT) need only be performed on a single AHU provided a copy of its program is copied and used for the other AHUs that use the identical sequence of operation. This test should be performed when the OAT is above 58°F. If the test cannot be delayed until those conditions, utilize pre-heat coil to heat 100% OA to 58°F pre-heat coil leaving temperature.		

Air Handling Unit Functional Performance Test

[Insert Your Logo Here] [Vendor Logo Here]

12a.	Preliminary Set Up		
Test Procedure: Release VAV/CAV boxes to auto.			
Test Procedure: Set DAT SP to 55°F.			
		Record actual BAS OAT.	°F
		Record MAT.	°F
		Record PHT.	°F
		Record DAT.	°F
		Record economizer dampers command.	%
		Record humidifier control valve command.	%
		Record pre-heat control valve command.	%
		Record program's time delay prior to going from State #1 to State #2 (TD 1/2).	Minute
		Record program's time delay prior to going from State #2 to State #1 (TD 2/1).	Minute
		Record program's time delay prior to going from State #2 to State #3 (TD 2/3).	Minute
		Record program's time delay prior to going from State #3 to State #2 (TD 3/2).	Minute
		Record program's time delay prior to going from State #3 to State #4 (TD 3/4).	Minute
		Record program's time delay prior to going from State #3 to State #3 (TD 4/3).	Minute
Test Procedure: Set all above time delays to 5 minutes.			
		Record program's OAT transition temperature setpoint from State #1 to State #2 (TSP 1/2).	°F
		Record program's OAT transition temperature setpoint from State #2 to State #1 (TSP 2/1).	°F
12b.	State #1: Mechanical Cooling		
		Record State the AHU is currently indexed to.	#
Test Procedure: Simulate OAT equal to TSP 1/2 + 2°F.			
		Record the simulated OAT.	°F
		If unit was in State #2, verify the TDI 2/1 times out in 5 minutes.	Y/N or N/A
		If unit was in State #3, verify unit immediately goes to State #1.	Y/N or N/A
		Verify AHU is operating in State #1.	Y/N
		Verify economizer dampers are closed.	Y/N
Test Procedure: Wait until MAT and DAT stabilize.			
		Record MAT.	°F
		Record pre-heat coil leaving air temperature.	°F
		Record DAT.	°F
		Record DAT SP.	°F
		Record PH coil control valve command.	%
		Record CHW control valve command.	%
		Record CHW CEP supply temperature.	°F
12c.	State #2: Full economizer w/ cooling coil		
Test Procedure: Simulate OAT equal to TSP 1/2 - 0.1°F.			
		Record simulated OAT.	°F
		Record initial CHW control valve command.	%
		Verify after 5 minutes, unit goes to State #2.	Y/N
		Verify Economizer dampers go from fully closed to fully open and remain open.	Y/N
Test Procedure: Wait until MAT and DAT stabilize.			
		Record MAT.	°F
		Record pre-heat coil leaving air temperature.	°F
		Record DAT.	°F
		Record DAT SP.	°F
		Record PH Coil control valve command.	%
		Record CHW control valve command.	%
Test Procedure: Simulate an OAT equal to TSP 2/1 + 0.1°F.			
		Record simulated OAT.	°F
		Record initial CHW control valve command.	%
		Verify after 5 minutes, unit goes to State #1.	Y/N
		Verify Economizer dampers go from fully open to fully closed.	Y/N
		Record adjusted CHW control valve command.	%

Air Handling Unit Functional Performance Test

	Test Procedure: Simulate OAT equal to TSP 1/2 - 0.1°F.		Record simulated OAT.		°F
			Record initial CHW control valve command.		Y/N
			Verify after 5 minutes, unit goes to State #2.		Y/N
			Verify Economizer dampers go from fully closed to fully open and remain open.		Y/N
12d.	State #3: Free Cooling				
			Verify AHU is in State #2 and OAT of TSP 1/2 -0.1°F is simulated.		Y/N
			Record MAT.		%
			Record DAT.		°F
			Record DAT SP.		°F
			Record pre-heat leaving temperature.		°F
			Record pre-heat coil control valve command.		%
			Record CHW control valve command.		%
			Record BAS OAT.		°F
	Test Procedure: Simulate MAT of 90°F to avoid MAT Low Limit from activating.				
	Test Procedure: Reset DAT SP to 90°F.				
			Verify CHW control valve goes to 0% open and stays closed.		Y/N
			Verify unit goes to State #3 after CHW valve has been closed for 5 minutes.		Y/N
			Verify economizer OA damper command goes to 0% open.		Y/N
	Test Procedure: Adjust DAT SP to actual DAT - 5°F.				
			Verify Economizer damper command is > 0%.		Y/N
	Test Procedure: Set DAT SP to 45°F.				
			Verify economizer dampers are commanded to 100% open and remain open.		Y/N
		Verify unit goes to State #2 when economizer dampers have been at 100% for 5 minutes.		Y/N	
12e.	MAT Low Limit Alarm (If no Pre-Heat Section)				
	Test Procedure: Simulate MAT of 44°F.				
			Verify MAT low limit alarm is issued to operator.		Y/N
			Verify AHU goes immediately to MAT Low Limit with no time delay.		Y/N
			Verify CHW valve goes to 100% open and stays open.		Y/N
			Verify minimum OA damper is open.		Y/N
			Verify relief dampers are fully closed.		Y/N
			Verify return dampers are fully open.		Y/N
			Verify none of the change of State timers activated.		Y/N
			Verify facility CHW pumps receive command to start if not already in operation.		Y/N
	Test Procedure: Wait more than 5 minutes, then set DAT SP to 45°F.				
			Verify relief dampers remain fully closed.		Y/N
			Verify return dampers are fully open.		Y/N
			Verify OAT remains simulated at TSP 1/2 - 0.1°F.		E/D
	Test Procedure: Reset MAT low limit alarm at front end and wait 7 minutes.				
			Verify facility CHW pumps were not commanded off.		Y/N
			Verify MAT low limit alarm did not reset.		Y/N
			Verify AHU remained in MAT low limit alarm.		Y/N
12f.	State #4: Pre-Heat				
			Verify AHU is in State #3 and OAT simulation remains at OAT of TSP 1/2 - 0.1°F.		Y/N
			Verify DAT SP remains at 90°F.		°F
			Verify economizer dampers are commanded 0% open and stay closed.		Y/N
			Verify pre-heat valve remains closed in State #3.		Y/N
			Verify unit goes to State #4 after economizer dampers are closed to 5 minutes.		Y/N
			Record pre-heat valve command.		%

Air Handling Unit Functional Performance Test

	Record DAT.		°F
Test Procedure: Reset pre-heat low limit temperature SP to 42°F.			
Test Procedure: Set DAT SP to 45°F.			
	Verify pre-heat valve is commanded 0% open and remains closed.		Y/N
	Verify unit goes to State #3 when pre-heat valve has been closed for 5 minutes.		Y/N
	Record economizer damper's command.		%
	Record DAT.		°F
Test Procedure: Simulate pre-heat coil leaving temperature of 40°F.			
	Verify pre-heat valve opens.		E/D
	Verify pre-heat low limit alarm is sent to BAS.		Y/N
Test Procedure: Simulate pre-heat coil leaving temperature of 37°F.			
	Verify AHU shuts down.		Y/N
	Verify pre-heat temperature shutdown alarm is sent to BAS.		Y/N
Test Procedure: Reset pre-heat temperature shutdown alarm at BAS.			
	Verify AHU restarts.		Y/N
12g.	Reset to Normal		
Test Procedure: Return all timers set points and temperature setpoints to their initial values. Remove all analog input simulated temperatures.			
	Record MAT.		°F
	Record OAT.		°F
	Record DAT.		°F
	Record DAT SP.		°F
	Record pre-heat leaving temperature.		°F
	Record CHW control valve command.		%
	Record economizer dampers command.		%
	Record pre-heat valve command.		%
	Record operating State #.		#
Notes:			

13	Humidifier Operation		
13a.	Record setpoints of the space or return duct humidistat controlling the humidifier.		% RH
	Record actual space or return duct humidity.		% RH
	Verify controlling limit SP of the RH sensor located downstream of humidifier is 80% RH.		Y/N
	Verify high limit alarm SP of the RH sensor located downstream of humidifier is 95% RH.		Y/N
13b.	Test Procedure: Override humidity SP of humidistat controlling humidifier to 90%		
	Verify BAS commands humidifier steam valve open.		Y/N
	Verify humidifier steam valve opens and steam enters airstream.		Y/N
13c.	Test Procedure: Override controlling limit SP to current supply RH - 10%.		
	Record current supply humidity.		%RH
	Record new controlling limit SP (Current RH-10%).		%RH
	Verify humidifier steam valve starts to close.		Y/N
	Verify humidifier valve is controlling to new controlling limit SP.		Y/N
	Record duct humidity when steam valve position stabilizes.		%RH
	Record BAS command to steam valve when steam valve position stabilizes.		%
13d.	Test Procedure: Reset controlling limit SP to 80% and override high limit alarm setpoint down in 5% increments.		
	Verify high limit alarm activates.		Y/N
	Verify humidifier steam valve closes.		Y/N
	Verify humidifier is disabled.		Y/N
13e.	Test Procedure: Manually reset humidifier alarm.		
13f.	Test Procedure: Reset controlling limit SP of the RH sensor located downstream of humidifier to 80% RH.		
13g.	Test Procedure: Reset high limit alarm SP of the RH sensor located downstream of humidifier to 95% RH.		
13h.	Test Procedure: Reset humidistat SP to original value.		
	Verify humidifier is reset and under normal control.		Y/N

Notes:

14 Fire Alarm

14a. Test Procedure: Initiate fire alarm signal to BAS (Can open/close fire alarm interface contact).

Verify supply fan shuts down.		Y/N
Verify return fan shuts down.		Y/N
Verify associated exhaust fans shut down.		Y/N
Verify FS/D's associated with AHU close after 10 second delay.		Y/N
Verify economizer dampers close.		Y/N

14b. Test Procedure: Simulate OAT to 40°F.

Verify pre-heat recirculation pump energizes.		Y/N

14c. Test Procedure: Initiate fire alarm reset signal to BAS (Can open/close fire alarm interface contact).

Verify FS/D's associated with AHU open.		Y/N
Verify after 10 second delay, supply fan starts.		Y/N
Verify return fan starts.		Y/N
Verify associated exhaust fans start.		Y/N

Notes:

15 Final Set Points:

Test Procedure: Record the following setpoints.

DAT SP		° F	Duct static pressure SP		In. W. G.
Pre-heat recirculating pump enable SP		° F	SF/RF CFM Differential SP		CFM
Pre-heat coil low limit SP		° F	State #1 enable temperature		° F
Pre-heat discharge temperature SP		° F	State #2 enable temperature		° F
Controlling limit/high limit humidistat SP		%			

Notes:

16 Final Readings

Test Procedure: Record the following parameters.

OAT		° F	Minimum OA Damper Position		%
OA Humidity		%RH	Economizer OA Damper		%
RAT		° F	Return Air Damper Position		%
RA Humidity		%RH	Relief Air Damper Position		%
MAT		° F	Preheat Valve Position		%
Pre-heat discharge temperature		° F	Humidifier Valve Position		%
Humidifier High Limit Reading		%RH	Chilled Water Valve Position		%
DAT		° F	SF VFD Speed		%
Duct Static Pressure		In.W.G.	RF VFD Speed		%
Supply Fan CFM		CFM	AHU Operating Finite State		#
Return CFM		CFM	Plant CHW Supply Temperature		° F
Outside Air CFM		CFM	Plant HW Supply Temperature		° F

17	24-Hour Unit Trends					
17a.	Test Procedure: Set up trend log to record the following required points once every 1 minute preferred or a minimum of once every 3 minutes for 24 hours. Data shall be in electronic tabulated form in excel and transmitted to engineer for review. Obtain HCA data formatting template from design engineer and present data in that format in excel spreadsheet.					
	OAT		° F	Return Air Damper Position		%
	MAT		° F	Relief Air Damper Position		%
	Pre-heat discharge temperature		° F	CHW Valve Position		%
	DAT		° F	Pre-Heat Valve Position		%
	DAT SP		° F	Humidifier Valve Position		%
	RAT		° F	Supply CFM		CFM
	HHW Supply Temperature		° F	Return CFM		CFM
	CHW Supply Temperature		° F	OA CFM		CFM
	OA Humidity		%RH	Supply Fan Speed		%
	Return Air Humidity		%RH	Return Fan Speed		%
	Return Air Humidity SP		%RH	Duct Static SP		in. W.G.
	Any monitored space humidity		%RH	Duct Static		in. W.G.
	Duct sensors used for controlling limit and high limit %RH		%RH	Operating State of AHU		#
	Minimum OA Damper Position		%	Record Trend Start Date and Time		
	Economizer OA Damper		%	Record Trend End Date and Time		
Notes:						

[Insert Your Logo Here] [Vendor Logo Here]

Air Terminal Unit Heating and Cooling Test Report

Instructions:

Follow the test procedures below. Complete the forms for only boxes noted to have problems during cooling or heating tests. Retain the completed forms from every test.

HEATING MODE TEST

Initialization: Confirm with design consultant that the AHU is operating at the appropriate DAT set point and that the heating water system is operating at the correct supply water set point (usually 180°F). Run this test prior to the Cooling Mode Test. The supply and return fan shall run continuously. Doors to spaces should be closed for this test. Immediately preceding Step One below, operate for a 3 hour continuous period with the thermostat setpoint of all boxes being tested set to 72°F. This is the Initialization Period.

STEP ONE - HEATING PERFORMANCE TEST

PROCEDURE: At the end of the initialization Period above, begin trending all the BAS points listed. After 1 hour of trending, adjust thermostat set point on all the system boxes to 76°F & continue trending for an additional 4.5 hours. The dead band between heating and cooling mode shall be 1°F.

TRENDING REQUIREMENTS

Trend the points listed in this paragraph at 3 minute intervals. Present the trended data in an Excel worksheet for each terminal unit. Graph the data per the templates provided by the Design Consultant. The columns in each worksheet shall be ordered (L to R) as follows: Date & Time in ascending order, Zone Temperature Set Point, Actual Zone Temperature, Terminal Unit Discharge Air Temperature, Reheat Valve Command, CFM Set Point, Actual CFM, Damper Commanded Position. Also trend the AHU DAT, AHU CHW valve % open, Plant CHW & HHW Supply Temperatures and OAT. The 5.5 hour terminal trend data for the Heating Mode Test is to be shaded red. The blank entries below in this form need only to be completed for the terminal boxes that do not satisfy the three test conditions listed below. Transmit forms & trends for all boxes that pass to the Design Consultant.

PASS/ FAIL CRITERIA

To pass the test, a box must meet all three of the conditions described at the bottom of this page. Transmit the trends for all boxes that pass the test to the Design Consultant. If a box fails to meet all three conditions, complete the information below, inspect, repair the box and conduct the heating test again on this box. When a failed box subsequently passes the test, transmit this form and only the successful trend data to the Design Consultant.

Value	Measured	Set Point	Difference
AHU Discharge Air Temp	°F	°F	°F
AHU CHW Valve Command	% open		
Supply Chilled Water Sys Temp	°F	°F	°F
Heating Hot Water Supply Temp.	°F	°F	°F
Outside Air Temp.	°F		

Information	Response	Information	Response
BAS Box Identification		Space - Name/No.	
Manufacturer		Inlet Size	
Model No.		Respective AHU	

Value	Measured	Design	Difference
Box Damper Position	% open		
BAS Airflow	cfm	cfm	% difference
Box Discharge Air Temp	°F		°F difference [T(Box) - T(AHU)]
Reheat Valve Position	% open		
Thermostat Setpoint	°F		
Space Temperature	°F		°F difference [T(setpoint) - T(space)]

Air Terminal Unit Heating and Cooling Test Report

[Insert Your Logo Here] [Vendor Logo Here]

1. If space temperature cannot be maintained within $\pm 1^{\circ}\text{F}$ of set point; record investigative findings and corrective measures taken.

2. If box cannot control airflow to within $\pm 10\%$ of design heating air flow, record investigative findings and corrective measures taken.

3. If box reheat valve is commanded 100% open & discharge air temperature is not equal to or greater than coil DAT in approved submittal then record investigative findings and corrective action taken. If reheat valve is commanded to less than 100% open, raise T-stat set point 5°F above current space temp, verify reheat valve is commanded 100% open & box discharge temp is not equal to or greater than coil DAT in approved submittal.

WITNESSED:

General Contractor

BAS Controls Contractor

Mechanical Contractor

Test and Balance Contractor

Air Terminal Unit Heating and Cooling Test Report

[Insert Your Logo Here] [Vendor Logo Here]

COOLING MODE TEST

The Cooling Mode Test begins at the end of the Heating Mode Test. In other words, the beginning of this test requires that the spaces have already been conditioned to 76°F. This test also requires that the AHU is operating at the appropriate DAT set point and that the heating water system is operating at the design maximum water supply water temperature (usually 180°F). Run this test without any supply fan or return fan shutdowns. Doors to the space should continue to be closed for this test.

COOLING PERFORMANCE TEST

PROCEDURE: Continue trending the points listed in the Heating Mode Test. These points are also listed below. Adjust the thermostat set point of all system boxes to 68°F & continue trending for an additional 4.5

TRENDING REQUIREMENTS

Trend the points listed in this paragraph at 3 minute intervals. Present the trended data in an Excel worksheet for each terminal unit. Graph the data per the templates provided by the Design Consultant. The columns in each worksheet shall be ordered (L to R) as follows: Date & Time in ascending order, Zone Temperature Set Point, Actual Zone Temperature, Terminal Unit Discharge Air Temperature, Reheat Valve Command, CFM Set Point, Actual CFM, Damper Commanded Position. Also trend the AHU DAT, AHU CHW valve % open, Plant CHW & HHW Supply Temperatures and OAT. The blank entries below in this form need only to be completed for the terminal boxes that do not satisfy the three test conditions listed below during the initial test. Transmit forms & trends for all boxes that pass to the Design Consultant.

PASS/ FAIL CRITERIA

To pass the test, a box must meet all three of the conditions described at the bottom of this page. Transmit the trends for all boxes that pass the test to the Design Consultant. If a box fails to meet all three conditions, complete the information below, inspect, repair the box and conduct the cooling test again on this box. When a failed box subsequently passes the test, transmit this form and only the successful trend data to the Design Consultant.

Information	Response	Information	Response
BAS Box Identification		Space - Name/No.	
Manufacturer		Inlet Size	
Model No.		Respective AHU	
Value	Measured	Design	Difference
Box Damper Position	% open		
BAS Airflow	cfm	cfm	% difference
Box Discharge Air Temp	°F		°F difference [T(Box) - T(AHU)]
Reheat Valve Position	% open		
Thermostat Setpoint	°F		
Space Temperature	°F		°F difference [T(setpoint) - T(space)]

1. If box damper position is 100% and space temperature cannot be maintained within +/- 1°F of set point; record investigation and corrective measures taken.

2. If box measured air flow is not within +/- 10% of design cooling air flow, record the investigation and corrective actions taken.

3. If reheat valve is commanded to 0% open & box discharge air temperature is not within + 2°F of AHU DAT, record the investigative findings and corrective actions taken. If reheat valve is commanded to greater than 0% open, lower t-stat set point 10°F below space temperature and repeat test and record results.

WITNESSED:

[Insert Your Logo Here] [Vendor Logo Here]

Air Terminal Unit Heating and Cooling Test Report

<i>General Contractor</i>	<i>BAS Controls Contractor</i>
<i>Mechanical Contractor</i>	<i>Test and Balance Contractor</i>

Appendix B-8: BAS Graphics Programmers' Guide



HCA | FACILITIGROUP
Infrastructure Solutions



Preface

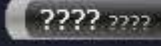
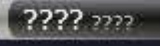
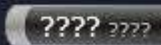
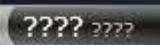
The Programmers Guide is intended to be a more detailed explanation of the features of the user interface. It demonstrates the functionality of navigation buttons and hidden data links.

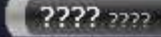
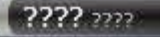
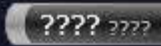
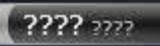
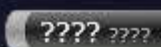
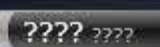
Not all graphic panels will be shown in the Programmer's Guide. All features mentioned in this guide should be carried through the entire user interface, even though they may only be displayed once.

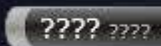
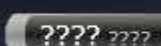
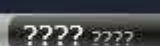
The graphic panels present here may not necessarily be of the latest revision, but the intended navigation and operation remains the same.

TriStar Skyline

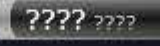
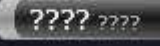
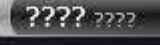
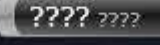
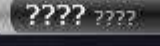
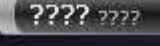
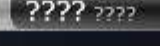
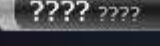
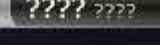
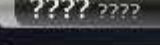
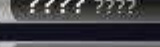
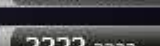
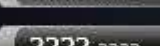
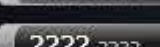
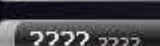
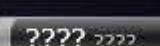
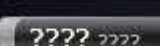
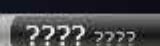
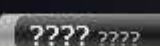
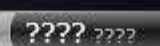
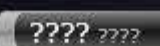
MEDICAL CENTER

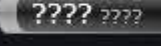
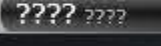
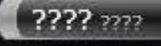
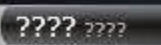
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	% RLA	???? ???? 	???? ???? 
	kW / Ton	???? ???? 	???? ???? 

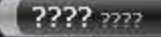
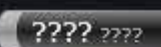
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	Tons	???? ???? 	???? ???? 

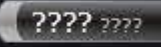
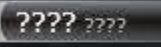
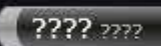
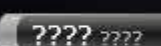
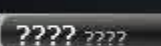
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	% RLA	???? ???? 	???? ???? 
	kW / Ton	???? ???? 	???? ???? 

extra box to be deleted if not used

Air Handlers	Sa Temp	Sa Static
AHU 01 - Area Served	???? ???? 	???? ???? 
AHU 02 - Area Served	???? ???? 	???? ???? 
AHU 03 - Area Served	???? ???? 	???? ???? 
AHU 04 - Area Served	???? ???? 	???? ???? 
AHU 05 - Area Served	???? ???? 	???? ???? 
AHU 06 - Area Served	???? ???? 	???? ???? 
AHU 07 - Area Served	???? ???? 	???? ???? 
AHU 08 - Area Served	???? ???? 	???? ???? 
AHU 09 - Area Served	???? ???? 	???? ???? 
AHU 10 - Area Served	???? ???? 	???? ???? 
AHU 11 - Area Served	???? ???? 	???? ???? 
AHU 12 - Area Served	???? ???? 	???? ???? 
AHU 13 - Area Served	???? ???? 	???? ???? 
AHU 14 - Area Served	???? ???? 	???? ???? 
AHU 15 - Area Served	???? ???? 	???? ???? 
AHU 16 - Area Served	???? ???? 	???? ???? 
AHU 17 - Area Served	???? ???? 	???? ???? 
AHU 18 - Area Served	???? ???? 	???? ???? 

Steam System		BLR-1	BLR-2
	% Firing Range	???? ???? 	???? ???? 
	Steam Flow	???? ???? 	???? ???? 
	Efficiency	???? ???? 	???? ???? 

Hot Water System		HX-1	HX-2
	HW Sup Temp	???? ???? 	???? ???? 
	HW Ret Temp	???? ???? 	???? ???? 
	Pump Status	???? ???? 	???? ???? 

Hot Water System		HWBLR-1	HWBLR-2
	% Firing Range	???? ???? 	???? ???? 
	Supply Temp	???? ???? 	???? ???? 
	Efficiency	???? ???? 	???? ???? 

extra box to be deleted if not used

Links to facility's Energy portal on HCAFI.com

FACILITIGROUP
Infrastructure Solutions



TriStar Skyline

MEDICAL CENTER

Links to Facility Public Website

Johnson Controls



Links to Contact Panel for JCI Rep, Energy Service Center, Utility providers

Links to individual equipment detail panel

Links to AHU Summary

Links to individual air handling units

Chilled Water System

CH-1

CH-2



Supply Temp	???? ???? ?	???? ???? ?
% RLA	???? ???? ?	???? ???? ?
kW / Ton	???? ???? ?	???? ???? ?



Condenser Water System

CT-1

CT-2



Speed	???? ???? ?	???? ???? ?
delta T	???? ???? ?	???? ???? ?
Tons	???? ???? ?	???? ???? ?



Chilled Water System

CH-3

CH-4



Supply Temp	???? ???? ?	???? ???? ?
% RLA	???? ???? ?	???? ???? ?
kW / Ton	???? ???? ?	???? ???? ?



Air Handlers

- AHU 01 - Area Served
- AHU 02 - Area Served
- AHU 03 - Area Served
- AHU 04 - Area Served
- AHU 05 - Area Served
- AHU 06 - Area Served
- AHU 07 - Area Served
- AHU 08 - Area Served
- AHU 09 - Area Served
- AHU 10 - Area Served
- AHU 11 - Area Served
- AHU 12 - Area Served
- AHU 13 - Area Served
- AHU 14 - Area Served
- AHU 15 - Area Served
- AHU 16 - Area Served
- AHU 17 - Area Served
- AHU 18 - Area Served

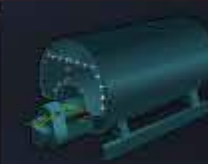
Sa Temp Sa Static

???? ???? ?	???? ???? ?
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???? ???? ?	???? ???? ?
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???? ???? ?	???? ???? ?
???? ???? ?	???? ???? ?
???? ???? ?	???? ???? ?
???? ???? ?	???? ???? ?
???? ???? ?	???? ???? ?

Steam System

BLR-1

BLR-2



% Firing Range	???? ???? ?	???? ???? ?
Steam Flow	???? ???? ?	???? ???? ?
Efficiency	???? ???? ?	???? ???? ?



Hot Water System

HX-1

HX-2



HW Sup Temp	???? ???? ?	???? ???? ?
HW Ret Temp	???? ???? ?	???? ???? ?
Pump Status	???? ???? ?	???? ???? ?



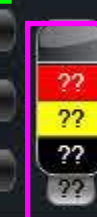
Hot Water System

HWBLR-1

HWBLR-2



% Firing Range	???? ???? ?	???? ???? ?
Supply Temp	???? ???? ?	???? ???? ?
Efficiency	???? ???? ?	???? ???? ?



Links to individual System Panel

extra box to be deleted if not used

The facility logo on the footer will now become the HOME button and will link to the Dashboard. Typical of ALL panels

Summarizes all alarms for the system.

extra box to be deleted if not used

Links to the facility's EnergyScript portal on HCAFI.com.
Typical of ALL panels

First Floor



Section A - AHU-02,03,04

Second Floor



Section B - OR's
Section C - AHU-05



Third Floor



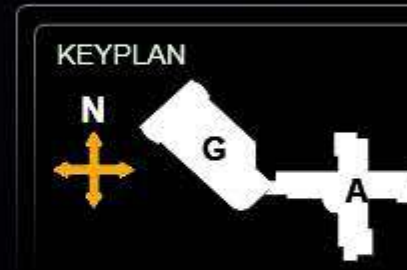
Section A - AHU-06,07,08,09,10,11
Section A - C-Section



Fourth Floor



Fifth Floor



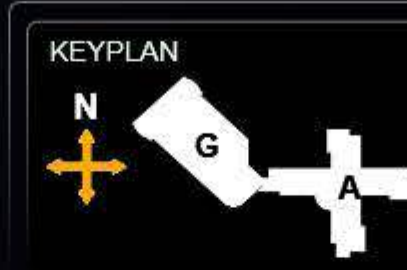
Sixth Floor



Seventh Floor



Eighth Floor



Ninth Floor



Roof



Section A - AHU-12,13

First Floor



Section A - AHU-02,03,04

Second Floor



Section B - OR's
Section C - AHU-05

Second Floor-Zone B
?? ?? ??
??

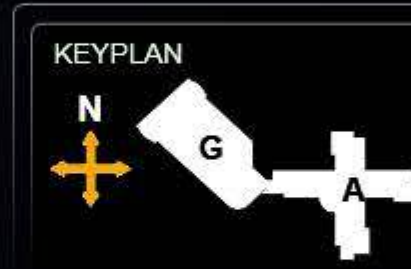
Third Floor



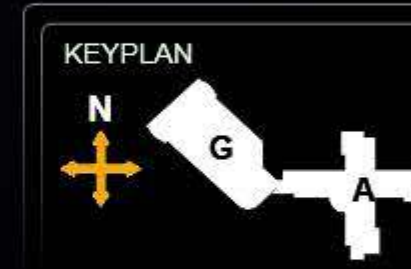
Section A - AHU-06,07,08,09,10,11
Section A - C-Section

Third Floor-Zone A
?? ?? ??
??

Fourth Floor



Fifth Floor



Sixth Floor



Seventh Floor



Eighth Floor



Ninth Floor



Roof



Section A - AHU-12,13

Alarm Modules are present for ORs and critical areas on this panel

Once the user clicks on this icon and the panel is loaded, the icon will change color to indicate. This is typical of every button on the Footer.



FLOOR



CHW



HW



STEAM



AHU



ENERGY



EPSS



ALARMS



AUX



LEGEND

The floor plan diagram illustrates the layout of a building, including the following components:

- CHILLER-1**, **CHILLER-2**, and **CHILLER-3**: Represented by 3D icons of industrial chillers on the left side of the plan.
- AHU-01**: Represented by a 3D icon of an Air Handling Unit at the bottom left.
- OR ZONE**: A central area labeled "OR ZONE" in a blue box, indicating a flexible space.
- OFFICE A5568**: A room located in the lower-left quadrant.
- OFFICE A5570** and **OFFICE A5571**: Two adjacent rooms located at the bottom center.
- OFFICE A5551**: A room located in the upper-right quadrant.
- A5049**: A room located in the lower-right quadrant, containing a staircase.

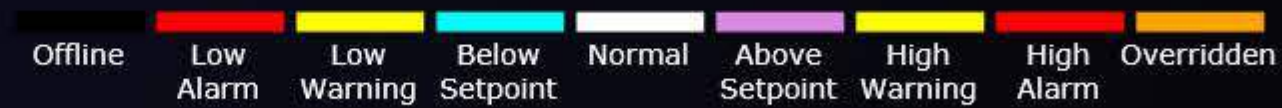
KEYPLAN

N

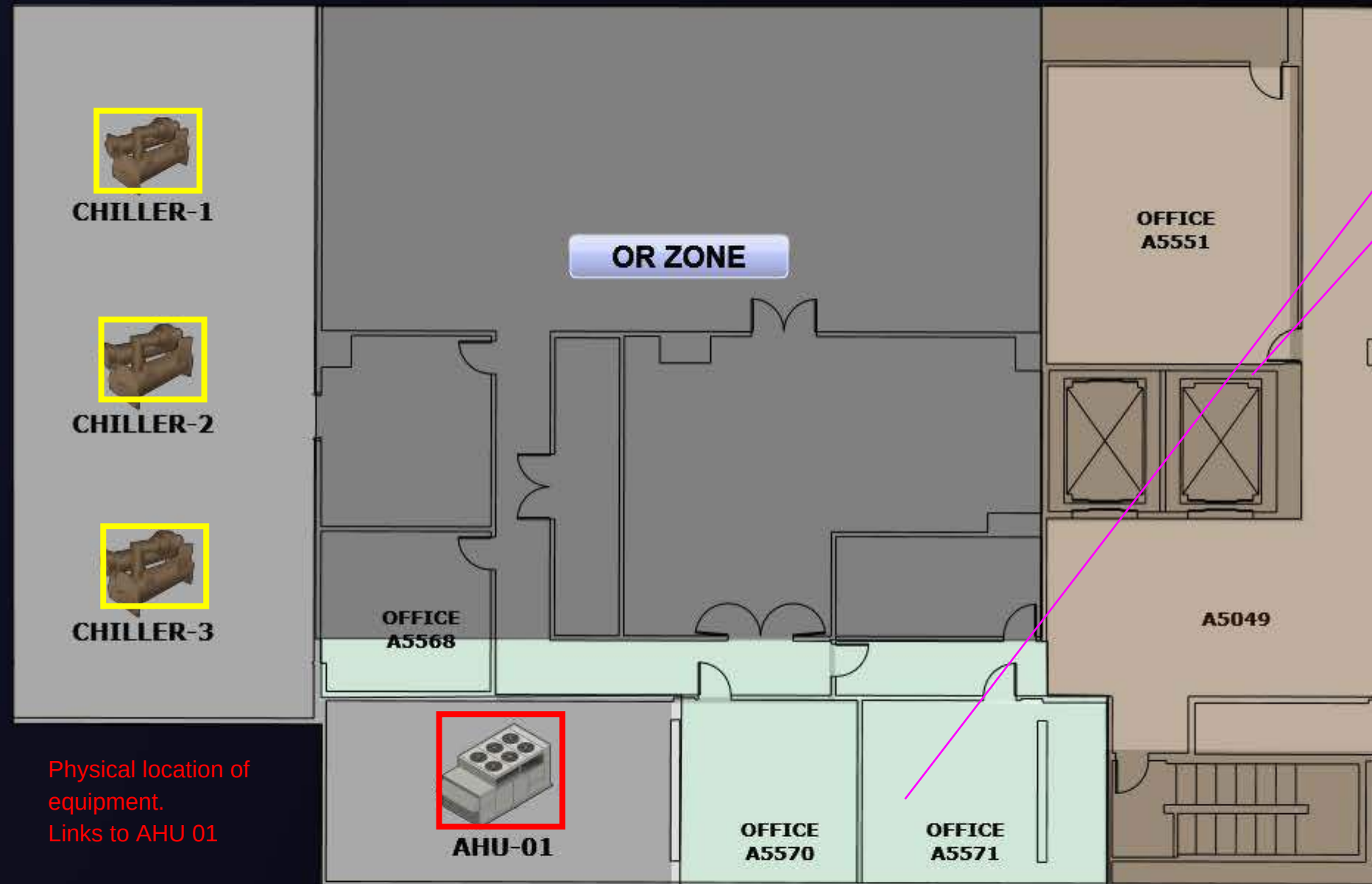
OR

A

B



Physical locations of equipment.
Links to individual Chiller Detail Panels



Physical location of equipment.
Links to AHU 01

AHU 01

AHU 02

Floor Plan shaded to show different serving AHU. Button colors correspond to floor plan colors



This alarm module shows only the alarms relevant to this graphic panel



Offline	Low Alarm	Low Warning	Below Setpoint	Normal	Above Setpoint	High Warning	High Alarm	Overridden

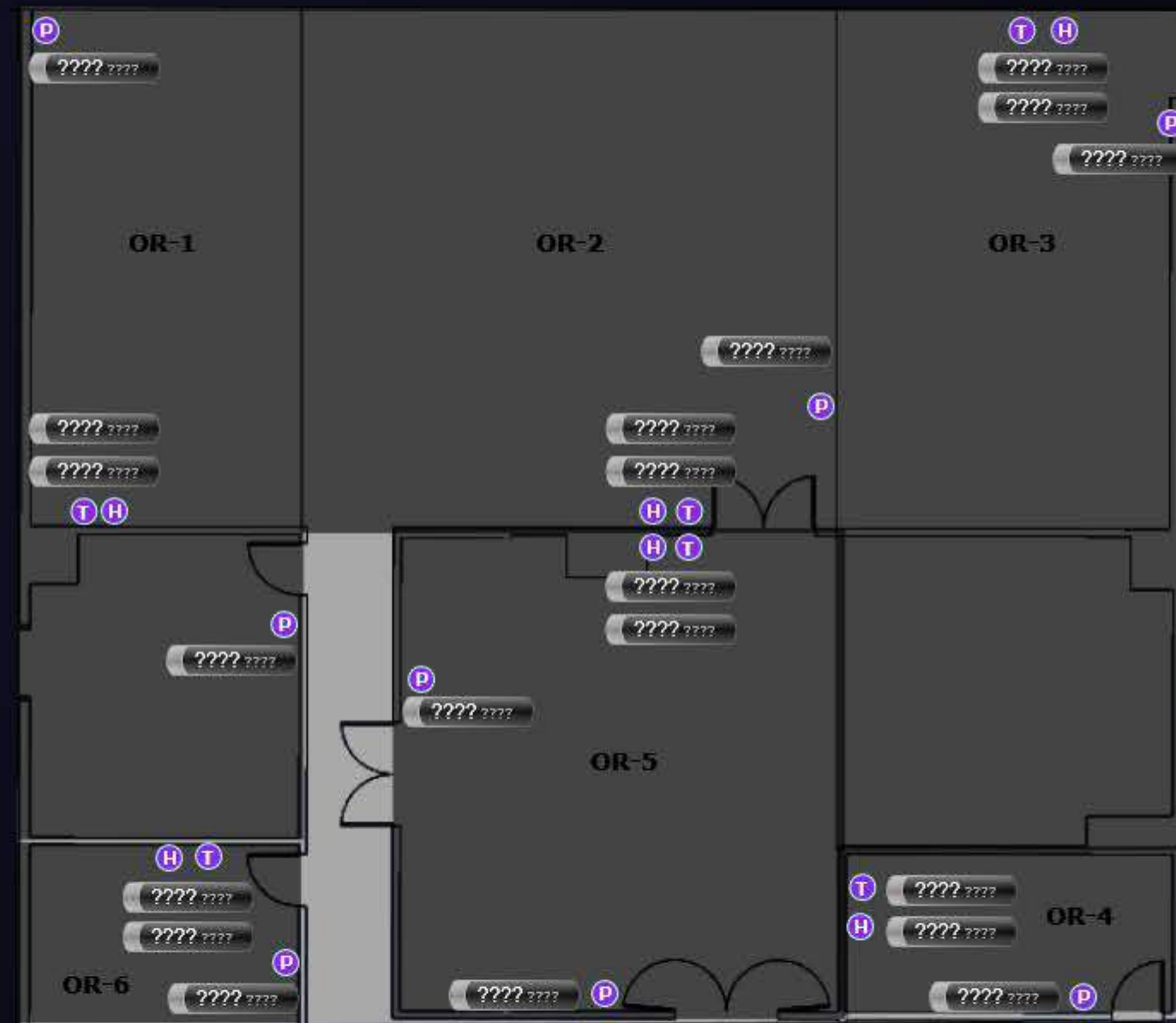
KEYPLAN

N

OR

A

B



Color	Status
Black	Offline
Red	Low Alarm
Yellow	Low Warning
Cyan	Below Setpoint
White	Normal
Purple	Above Setpoint
Yellow	High Warning
Red	High Alarm
Orange	Overridden

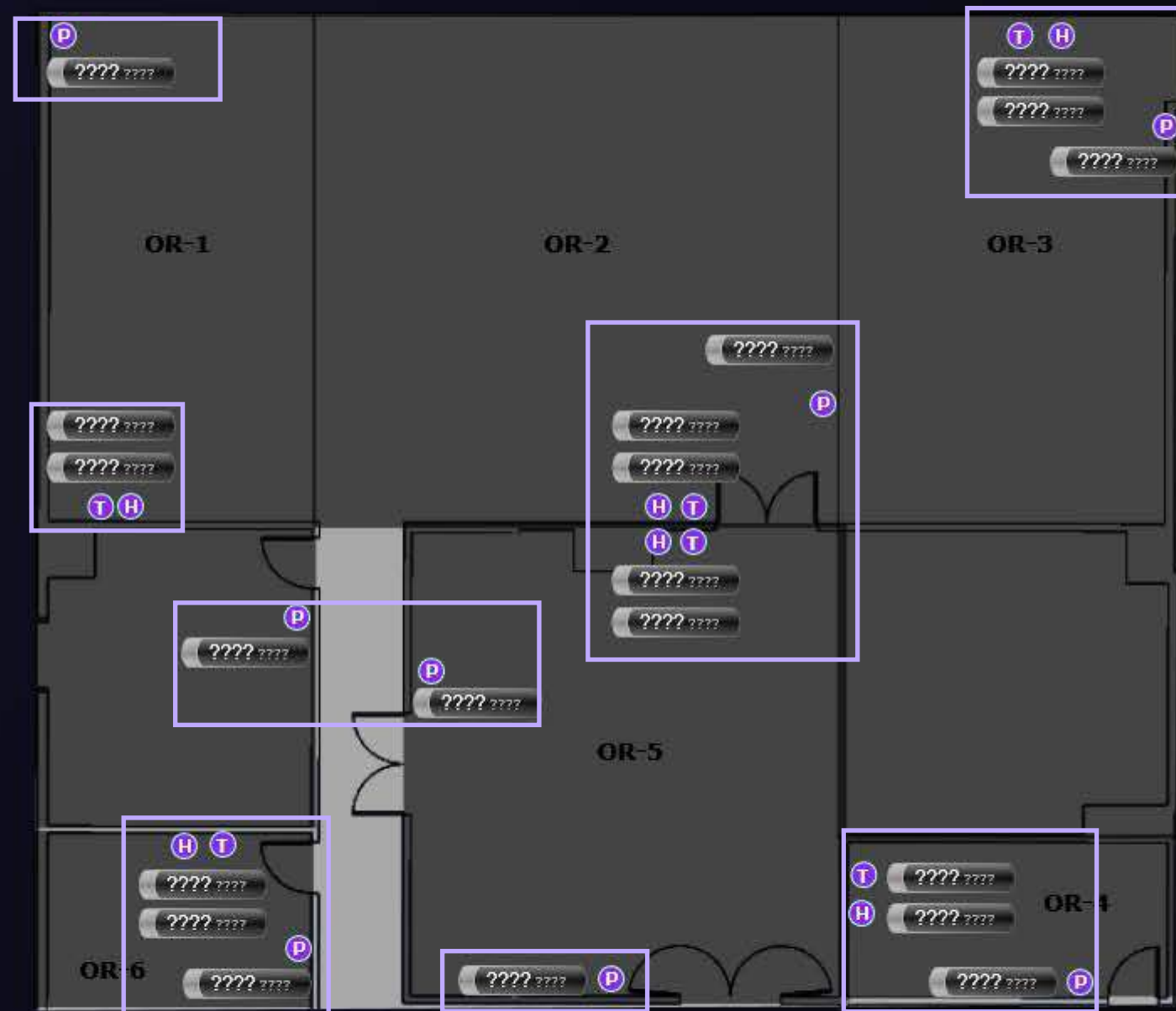
KEYPLAN

N

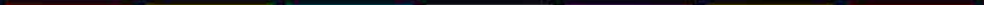
OR

A

B



Temperature, Humidity, and Pressure sensors for the OR Zone should be located on this floor plan in the same location as the facility.



Color	Status
Black	Offline
Red	Low Alarm
Yellow	Low Warning
Cyan	Below Setpoint
White	Normal
Purple	Above Setpoint
Yellow	High Warning
Red	High Alarm
Orange	Overridden

VFD Speed
???? ????
Command
???? ????
Status
???? ????
VFD Error

Economizer Position	OA CFM x 100
???? ???? ?	???? ???? ?

MA Temp
???? ????

Pre-Heat Temp
???? ????

Status
???? ???? ?
Command
???? ???? ?
VFD Speed
???? ???? ?

SA CFM x 100
 ????

Static Pressure
% Rh

Humidifier
Valve Cmd
???? ????

STEAM

Smoke Damper Cmd

CHW Valve Cmd
???? ????

HW Valve Cmd
???? ???? ?

EA

OA

% RH

% Rh

RA CFM x 100
 ????

RA Temp
???? ???? ?

RA Enthalpy
???? ????

OA Temp
???? ????

OA Enthalpy

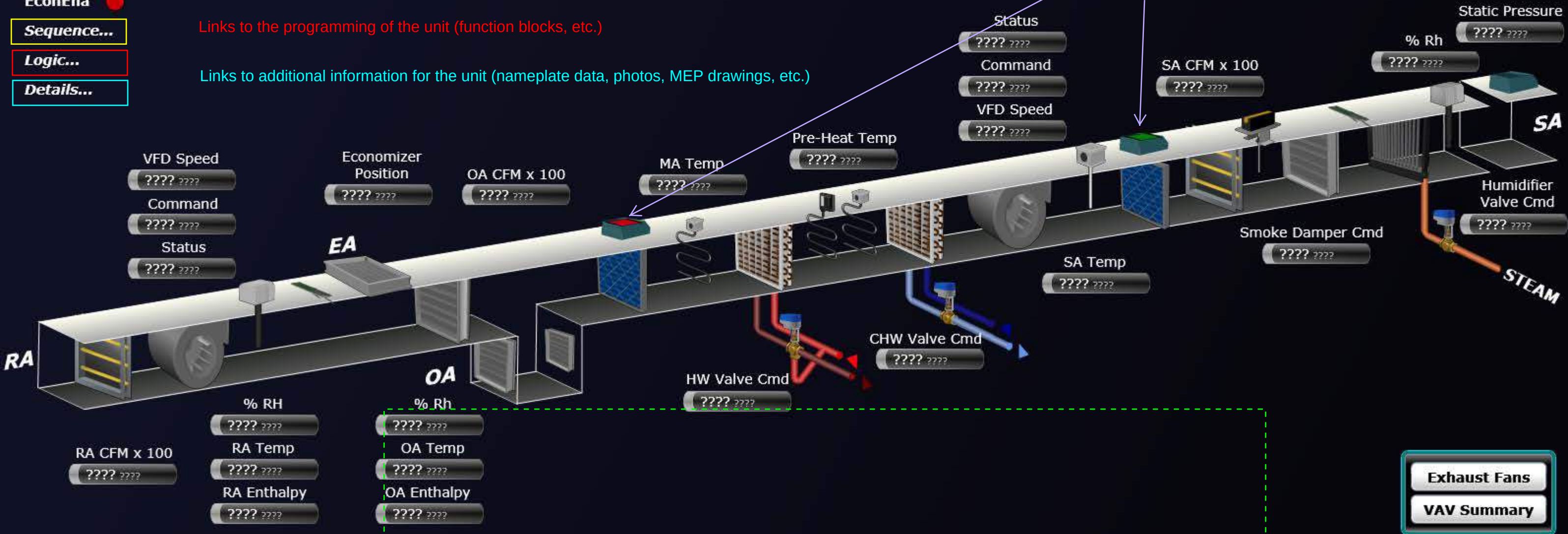
System Parameters		SETPOINT
SA Temp	???? ???? ?	???? ???? ?
MA Temp	???? ???? ?	???? ???? ?
Pre-Heat Temp	???? ???? ?	???? ???? ?
Humidifier	???? ???? ?	???? ???? ?
SA Static Press	???? ???? ?	???? ???? ?

Alarms	
Freeze Stat	????
Pre-Filter	????
Final Filter	????
High SA Static	????
Fire Alarm	????

????	????
????	????

Links to additional information for the unit (nameplate data, photos, MEP drawings, etc.)

State squares to indicate the status of the filters. Green=Clean, Red=Dirty (alarm)



SETPOINT

SA Temp	???? ???? ?	???? ???? ?
MA Temp	???? ???? ?	???? ???? ?
Pre-Heat Temp	???? ???? ?	???? ???? ?
Humidifier	???? ???? ?	???? ???? ?
SA Static Press	???? ???? ?	???? ???? ?

Upon a right-click > View Trend, the trend viewer window will pop up here for any point that is trended

Freeze Stat	????
Pre-Filter	????
Final Filter	????
High SA Static	????
Fire Alarm	????

Chiller Summary			
Chiller 01	????	ChwsTmp	????
Chiller 02	????	ChwrTmp	????
Chiller 03	????	SChwGPM	????
Chiller 04	????	Total Load	????

Boiler Summary			
Boiler 01	????	HwsTmp	????
Boiler 02	????	HwrTmp	????
		HwGPM	????
		Total Load	????

Equipment	Mode	EconState	SaTmp deg F	SaTmpSpt deg F	SaStp in wc	SaStPSpt in wc	ChwVlv % Open	MaTmp deg F	PrHtVlv % Open	PrHtTmp deg F	PrHtTmpSpt deg F	RaTmp deg F	RaRh % RH	BoxTotCFM
AHU 01 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 02 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 03 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 04 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 05 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 06 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 07 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 08 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 09 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 10 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 11 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 12 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 13 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 14 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 15 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????

OR Summary

AHU Details

Next >

Chiller Summary

Chiller 01	????	ChwsTmp	????
Chiller 02	????	ChwrTmp	????
Chiller 03	????	SChwGPM	????
Chiller 04	????	Total Load	????

Links to individual equipment detail panels

Boiler Summary

Boiler 01	????	HwsTmp	????
Boiler 02	????	HwrTmp	????
		HwGPM	????
		Total Load	????

Links to individual air handling units

Equipment	Mode	EconState	SaTmp deg F	SaTmpSpt deg F	SaStp in wc	SaStPSpt in wc	ChwVlv % Open	MaTmp deg F	PrHtVlv % Open	PrHtTmp deg F	PrHtTmpSpt deg F	RaTmp deg F	RaRh % RH	BoxTotCFM
AHU 01 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 02 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 03 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 04 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 05 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 06 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 07 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 08 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 09 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 10 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 11 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 12 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 13 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 14 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????
AHU 15 - Area Served	????	????	????	????	????	????	????	????	????	????	????	????	????	????

OR Summary

AHU Details

Next >

Links to Operating Room Summary

Links to Tailored Summary with all other AHU points

Links to 2nd panel for additional AHUs. Delete if unused

Facility Name - OR Summary

???? ??

???? ??

AHU 01 Summary

Econ State	????	ChwVlvPos	????
SaTmp	????	HwVlvPos	????
RaTmp	????	BoxTotCFM	????
RaRh	????	Total Load	????

Chiller Summary

Chiller 01	????	ChwsTmp	????
Chiller 02	????	ChwrTmp	????
Chiller 03	????	SChwGPM	????
Chiller 04	????	Total Load	????

Boiler Summary

Boiler 01	????	HwsTmp	????
Boiler 02	????	HwrTmp	????
		HwGPM	????
		Total Load	????

Equipment	Mode	ZnTmp deg F	ZnTmpSpt deg F	ZnRh % RH	ZnRhSpt % RH	ReHtVlv % Open	DaCFM CFM	DaCFMSpt CFM	DmprPos % Open	Door Sensor	ZnPress in wc			
OR 01 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 02 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 03 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 04 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 05 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 06 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 07 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 08 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 09 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 10 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 11 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 12 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 13 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 14 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 15 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????

< Previous

Next >



Links to AHU 01 graphic panel

Facility Name - OR Summary

???? ???? ?

???? ???? ?

AHU 01 Summary

Econ State	????	ChwVlvPos	????
SaTmp	????	HwVlvPos	????
RaTmp	????	BoxTotCFM	????
RaRh	????	Total Load	????

Chiller Summary

Chiller 01	????	ChwsTmp	????
Chiller 02	????	ChwrTmp	????
Chiller 03	????	SChwGPM	????
Chiller 04	????	Total Load	????

Boiler Summary

Boiler 01	????	HwsTmp	????
Boiler 02	????	HwrTmp	????
		HwGPM	????
		Total Load	????

Links to individual VAV units

Links to individual equipment detail panels

Equipment	Mode	ZnTmp deg F	ZnTmpSpt deg F	ZnRh % RH	ZnRhSpt % RH	ReHtVlv % Open	DaCFM CFM	DaCFMSpt CFM	DmprPos % Open	Door Sensor	ZnPress in wc	Remove unused columns			
OR 01 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 02 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 03 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 04 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 05 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 06 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 07 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 08 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 09 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 10 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 11 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 12 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 13 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 14 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????
OR 15 - VV 01-101	????	????	????	????	????	????	????	????	????	????	????	????	????	????	????

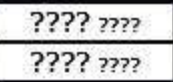
< Previous

Links to 2nd panel for additional ORs

Next >



????	????
????	????



????	????
????	????



CT-1

CWP-1



CH-2
770 tons
% Run Load Amps

???? ???? ?



CHW

Links to Condenser Water Loop

???? ???? ?

???? ???? ?

Bypass Valve

????



??

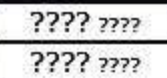
Links to Chilled water loop

????

CHWS



????	????
????	????





Chiller 1 - Nameplate

Serial Number -
Model Number -
Installation Date -

Chiller 1 Efficiency

???? ????

Total Plant Efficiency

???? ????



Condenser Water Loop

CT-1 DetailsCT-2 Details

Chilled Water Loop

CH-1 DetailsCH-2 Details

CHILLER-1 Parameters

Manufacturer	???? ????
Command	???? ????
Status	???? ????
Efficiency	???? ????
Oil Temp	???? ????
Oil Press Diff	???? ????
CHW Lvg Temp	???? ????
CHW Ent Temp	???? ????
CW Lvg Temp	???? ????
CW Ent Temp	???? ????
% Full Load Amps	???? ????
Evap Refrig Press	???? ????
Cond Refrig Press	???? ????
Comp Dis Refrig Temp	???? ????
Evap Refrig Temp	???? ????
Cond Refrig Temp	???? ????
CHW Setpoint	???? ????
Cond Water Flow	???? ????
CHW Flow	???? ????
Capacity	???? ????

CHILLER-1 Parameters

System Reset	???? ????
System Eanble	???? ????
Runtime Rotate	???? ????
Rot SCHW Pumps	???? ????
Pump Down Time	???? ????
Pump Runtime Reset	???? ????
Lead Chiller Fail	???? ????
Rot Chillers	???? ????
CH Runtime Reset	???? ????
PCHWP-1A in Hand	???? ????
PCHWP-1A Runtime	???? ????
CH-1 Alm CH Panel	???? ????
CH-1 Runtime Exd	???? ????

Chiller 1 - Nameplate

Serial Number -
Model Number -
Installation Date -

On a detail page, any and all information regarding that piece of equipment shall be accessed on this panel, either by listing it (as shown) or linking to it.

Chiller 1 Efficiency

???? ????

Total Plant Efficiency

???? ????

CHILLER-1

Chlr1Sts

Chlr1Cmd



If a button exists for a page that is currently being viewed, shade the Fill of the button Orange Red

CHILLER-1 Parameters

Manufacturer	???? ????
Command	???? ????
Status	???? ????
Efficiency	???? ????
Oil Temp	???? ????
Oil Press Diff	???? ????
CHW Lvg Temp	???? ????
CHW Ent Temp	???? ????
CW Lvg Temp	???? ????
CW Ent Temp	???? ????
% Full Load Amps	???? ????
Evap Refrig Press	???? ????
Cond Refrig Press	???? ????
Comp Dis Refrig Temp	???? ????
Evap Refrig Temp	???? ????
Cond Refrig Temp	???? ????
CHW Setpoint	???? ????
Cond Water Flow	???? ????
CHW Flow	???? ????
Capacity	???? ????

CHILLER-1 Parameters

System Reset	???? ????
System Eanble	???? ????
Runtime Rotate	???? ????
Rot SCHW Pumps	???? ????
Pump Down Time	???? ????
Pump Runtime Reset	???? ????
Lead Chiller Fail	???? ????
Rot Chillers	???? ????
CH Runtime Reset	???? ????
PCHWP-1A in Hand	???? ????
PCHWP-1A Runtime	???? ????
CH-1 Alm CH Panel	???? ????
CH-1 Runtime Exd	???? ????

Condenser Water Loop

CT-1 Details CT-2 Details

Chilled Water Loop

CH-1 Details CH-2 Details

Chiller 5 - Name Plate

Serial Number -

Model Number -

Installation Date -

Chiller 5 Efficiency

???? ???? ?

Chiller 5 - Low Temperature

Chlr05-LTSts

???? ???? ?

Chlr05-LTCmd

???? ???? ?



CH-5 LT
770 tons

% Run Load Amps

???? ???? ?

Low Temp Return

???? ???? ?

Low Temp Supply

???? ???? ?

LT-CHWR

LT-CHWS

Valve Command

???? ???? ?

AHU Served

Chiller 5-LT Parameters

Manufacturer

???? ???? ?

Capacity

???? ???? ?

Command

???? ???? ?

Status

???? ???? ?

Efficiency

???? ???? ?

Oil Temp

???? ???? ?

Oil Press Diff

???? ???? ?

CHW Lvg Temp

???? ???? ?

CHW Ent Temp

???? ???? ?

CW Lvg Temp

???? ???? ?

CW Ent Temp

???? ???? ?

% Full Load Amps

???? ???? ?

Evap Refrig Press

???? ???? ?

Cond Refrig Press

???? ???? ?

Comp Dis Refrig Temp

???? ???? ?

Evap Refrig Temp

???? ???? ?

Cond Refrig Temp

???? ???? ?

CHW Setpoint

???? ???? ?

Cond Water Flow

???? ???? ?

CHW Flow

???? ???? ?

Chiller 5-LT Parameters

System Reset

???? ???? ?

System Eanble

???? ???? ?

Runtime Rotate

???? ???? ?

Rot SCHW Pumps

???? ???? ?

Pump Down Time

???? ???? ?

Pump Runtime Reset

???? ???? ?

Lead Chiller Fail

???? ???? ?

Rot Chillers

???? ???? ?

CH Runtime Reset

???? ???? ?

PCHWP-5A in Hand

???? ???? ?

PCHWP-5A Runtime

???? ???? ?

CH-5 Alm CH Panel

???? ???? ?

CH-5 Runtime Exd

???? ???? ?

????

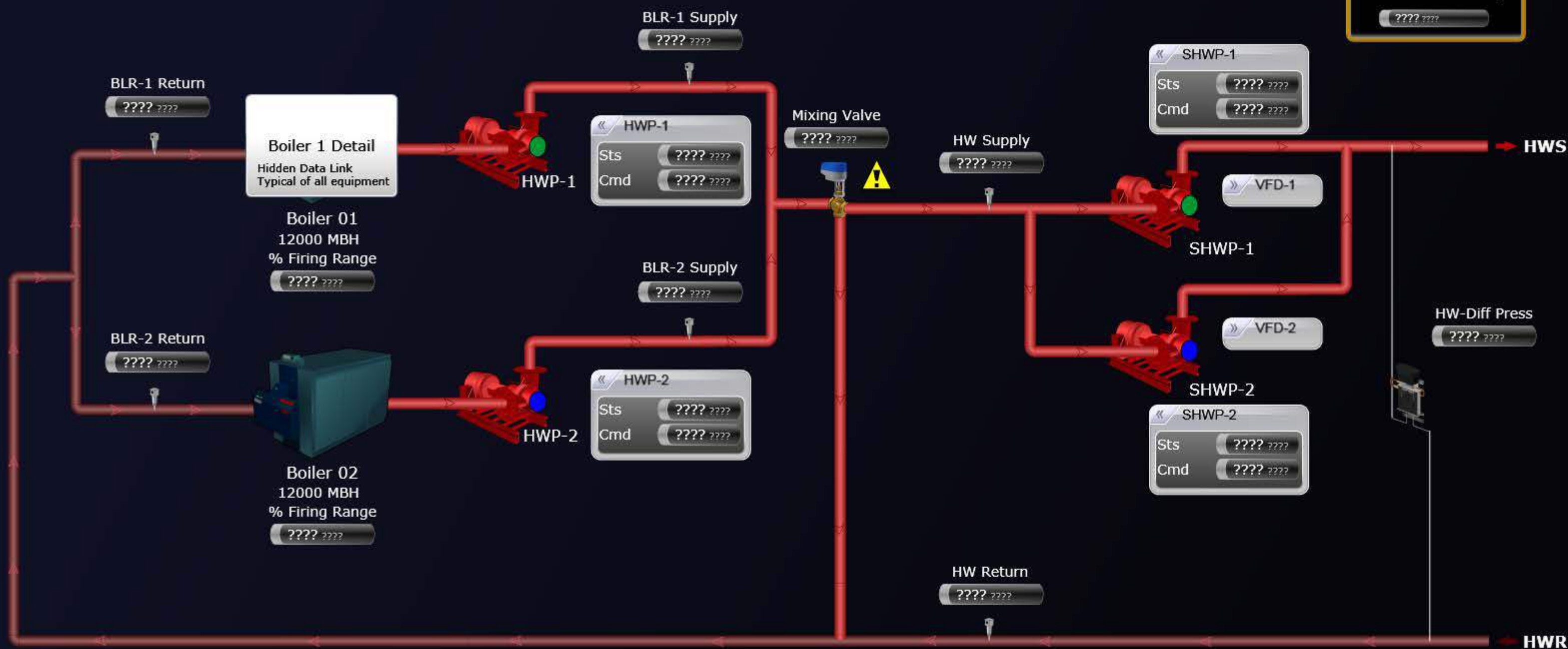
???? ???? ?

????

???? ???? ?

HW Plant Efficiency

???? ???? ?



Facility Name - Hot Water Plant Overview

???? ????
???? ????
HW Plant Efficiency
???? ????
HWS
HWR
BLR-1 Supply
BLR-1 Return
BLR-2 Return
BLR-2 Supply
HWP-1
HWP-2
Mixing Valve
HW Supply
HW Return
SHWP-1
SHWP-2
VFD-1
VFD-2
HW-Diff Press

HW Boiler capacity should always be written in MBH (1000 BTU/hr)

Boiler 1 Detail
Hidden Data Link
Typical of all equipment

Boiler 01
12000 MBH
% Firing Range
???? ????
HWP-1
Sts
Cmd
???? ????
???? ????
BLR-1 Supply
BLR-1 Return
BLR-2 Return
BLR-2 Supply
HWP-2
Sts
Cmd
???? ????
???? ????
Mixing Valve
HW Supply
HW Return
SHWP-1
SHWP-2
VFD-1
VFD-2
HW-Diff Press

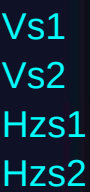
Boiler 02
12000 MBH
% Firing Range
???? ????
HWP-1
Sts
Cmd
???? ????
???? ????
BLR-1 Supply
BLR-1 Return
BLR-2 Return
BLR-2 Supply
HWP-2
Sts
Cmd
???? ????
???? ????
Mixing Valve
HW Supply
HW Return
SHWP-1
SHWP-2
VFD-1
VFD-2
HW-Diff Press

????	????
????	????



HX Details





Facility Name - VAV Summary

???? ???? ?

???? ???? ?

Equipment	Mode	ZnTmp deg F	ZnTmpSpt deg F	ReHtVlv % Open	DaCFM CFM	DaCFMSpt CFM	DmprPos % Open
VV 01-101 - Area Served	????	????	????	????	????	????	????
VV 01-102 - Area Served	????	????	????	????	????	????	????
VV 01-103 - Area Served	????	????	????	????	????	????	????
VV 01-104 - Area Served	????	????	????	????	????	????	????
VV 01-105 - Area Served	????	????	????	????	????	????	????
VV 01-106 - Area Served	????	????	????	????	????	????	????
VV 01-107 - Area Served	????	????	????	????	????	????	????
VV 01-108 - Area Served	????	????	????	????	????	????	????
VV 01-109 - Area Served	????	????	????	????	????	????	????
VV 01-110 - Area Served	????	????	????	????	????	????	????
VV 01-111 - Area Served	????	????	????	????	????	????	????
VV 01-112 - Area Served	????	????	????	????	????	????	????
VV 01-113 - Area Served	????	????	????	????	????	????	????
VV 01-114 - Area Served	????	????	????	????	????	????	????
VV 01-115 - Area Served	????	????	????	????	????	????	????
VV 01-116 - Area Served	????	????	????	????	????	????	????
VV 01-117 - Area Served	????	????	????	????	????	????	????
VV 01-118 - Area Served	????	????	????	????	????	????	????
VV 01-119 - Area Served	????	????	????	????	????	????	????
VV 01-120 - Area Served	????	????	????	????	????	????	????
VV 01-121 - Area Served	????	????	????	????	????	????	????
VV 01-122 - Area Served	????	????	????	????	????	????	????
VV 01-123 - Area Served	????	????	????	????	????	????	????
VV 01-124 - Area Served	????	????	????	????	????	????	????

AHU 01 Summary

Econ State	????	ChwVlvPos	????
SaTmp	????	HwVlvPos	????
RaTmp	????	BoxTotCFM	????
RaRh	????	Total Load	????

Chiller Summary

Chiller 01	????	ChwsTmp	????
Chiller 02	????	ChwrTmp	????
Chiller 03	????	SChwGPM	????
Chiller 04	????	Total Load	????

Boiler Summary

Boiler 01	????	HwsTmp	????
Boiler 02	????	HwrTmp	????
		HwGPM	????
		Total Load	????





Boiler 01	????	HwsTmp	????
Boiler 02	????	HwrTmp	????
		HwGPM	????
		Total Load	????

General Exhaust Fan Functional Performance Test

[Insert Your Logo Here] [Vendor Logo Here]

Reference	Date

Description	Attribute
Test Procedure: Command fan on.	
Expected Response: Fan is on.	Y/N
Test Procedure: Command fan off.	
Expected Response: Fan is off.	Y/N
Test Procedure: With fan commanded on, fail fan.	
Expected Response: Fan turns off.	Y/N
Expected Response: Alarm is sent to BAS.	Y/N
Test Procedure: Simulate belt failure while fan is commanded on.	
Expected Response: Alarm is sent to BAS.	Y/N

ISOLATION ROOM FUNCTIONAL PERFORMANCE TEST

[Insert Your Logo Here] [Vendor Logo Here]

Isolation Room #		Date	

1	Parameters	Response
	Space Temperature Setpoint	°F
	Space Temperature	°F
	Supply Airflow Setpoint	CFM
	Supply Airflow	CFM
	Exhaust Airflow	CFM
	CFM Offset Setpoint	CFM
	CFM Offset	CFM
	Space Differential Pressure	inches
	Supply Damper Position	%
	Exhaust Damper Position	%
	AHU Discharge Air Temperature	°F
	Terminal Discharge Air Temperature	°F

2	Normal Operation	Response
2a.	Test Procedure: Isolation room is under normal operation.	
	Expected Response: Exhaust damper modulates to maintain CFM setpoint.	Y/N
	Expected Response: Supply damper modulates to maintain CFM offset.	Y/N
	Expected Response: HW valve modulates to maintain space temperature setpoint.	Y/N
	Expected Response: Isolation fan modulates to maintain static pressure setpoint.	Y/N
2b.	Test Procedure: Raise space temperature setpoint.	
	Expected Response: HW valve modulates to maintain space temperature setpoint.	Y/N
	Expected Response: Supply and exhaust dampers modulate to maintain CFM setpoint and CFM offset.	Y/N
2c.	Test Procedure: Lower space temperature setpoint.	
	Expected Response: HW valve closes.	Y/N
	Expected Response: Supply and exhaust dampers modulate to maintain CFM setpoint and CFM offset.	Y/N
	Expected Response: Space differential pressure is below -0.01".	Y/N
	Record: Space differential pressure.	inches
	Expected Response: Space pressure monitor can be seen from BAS.	Y/N
2d.	Test Procedure: Simulate space pressure is above -0.01" by opening door.	
	Expected Response: Alarm is sent to nurse station.	Y/N
	Expected Response: Alarm is sent to BAS.	Y/N
2e.	Test Procedure: Fail isolation exhaust fan.	
	Expected Response: Alarm is sent to BAS.	Y/N
2f.	Test Procedure: Simulate broken belt while fan is running.	
	Expected Response: Alarm is sent to BAS stating belt is broken.	Y/N

[Insert Your Logo Here] [Vendor Logo Here]

VAV Trend Data

Date:
Facility Name:
Project:
AHU:

VAV Box I.D.
Design Heating CFM:
Design Cooling CFM:

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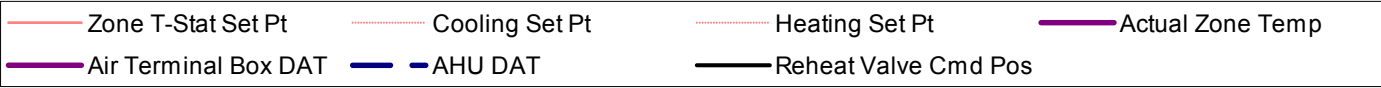
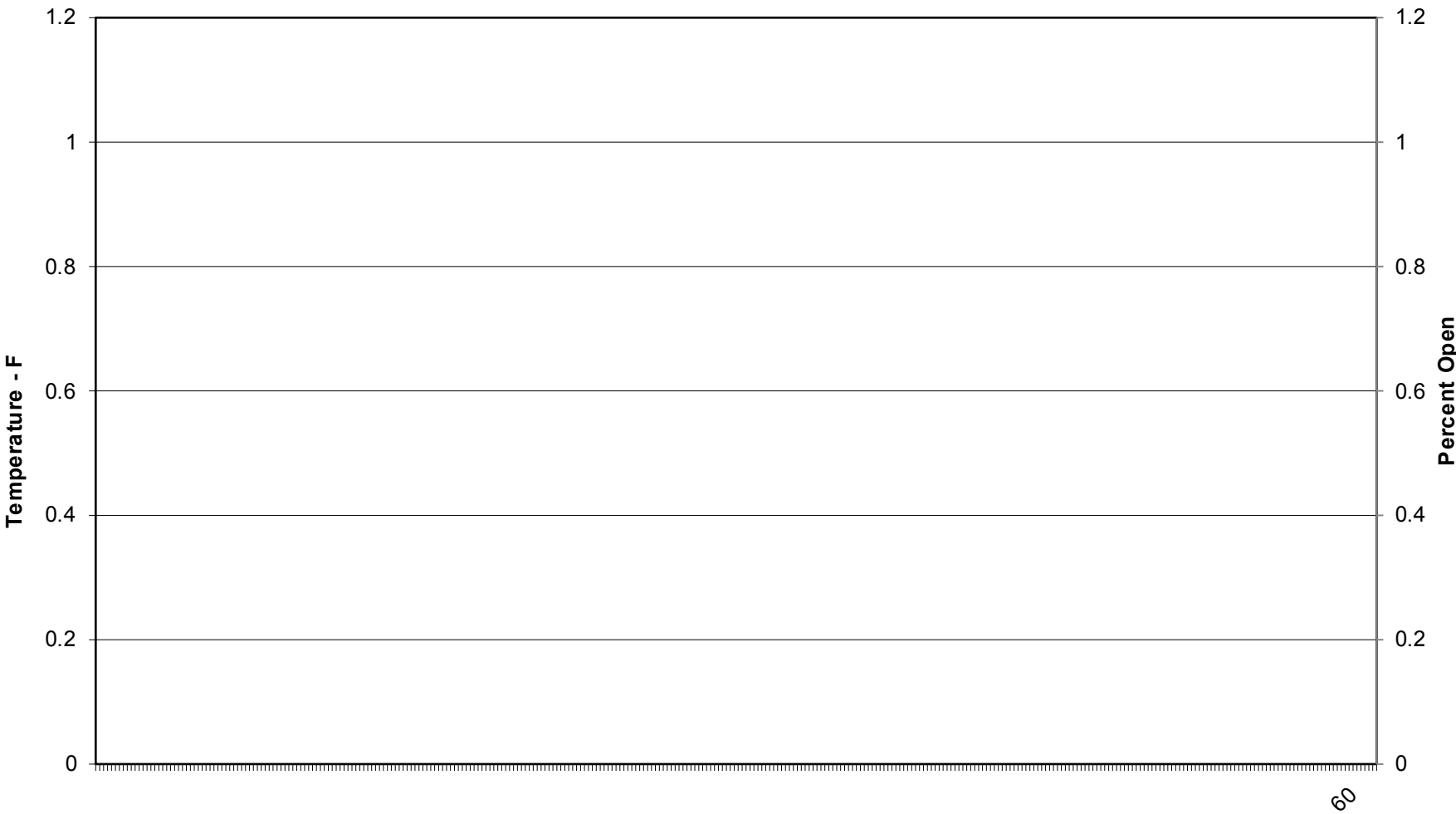
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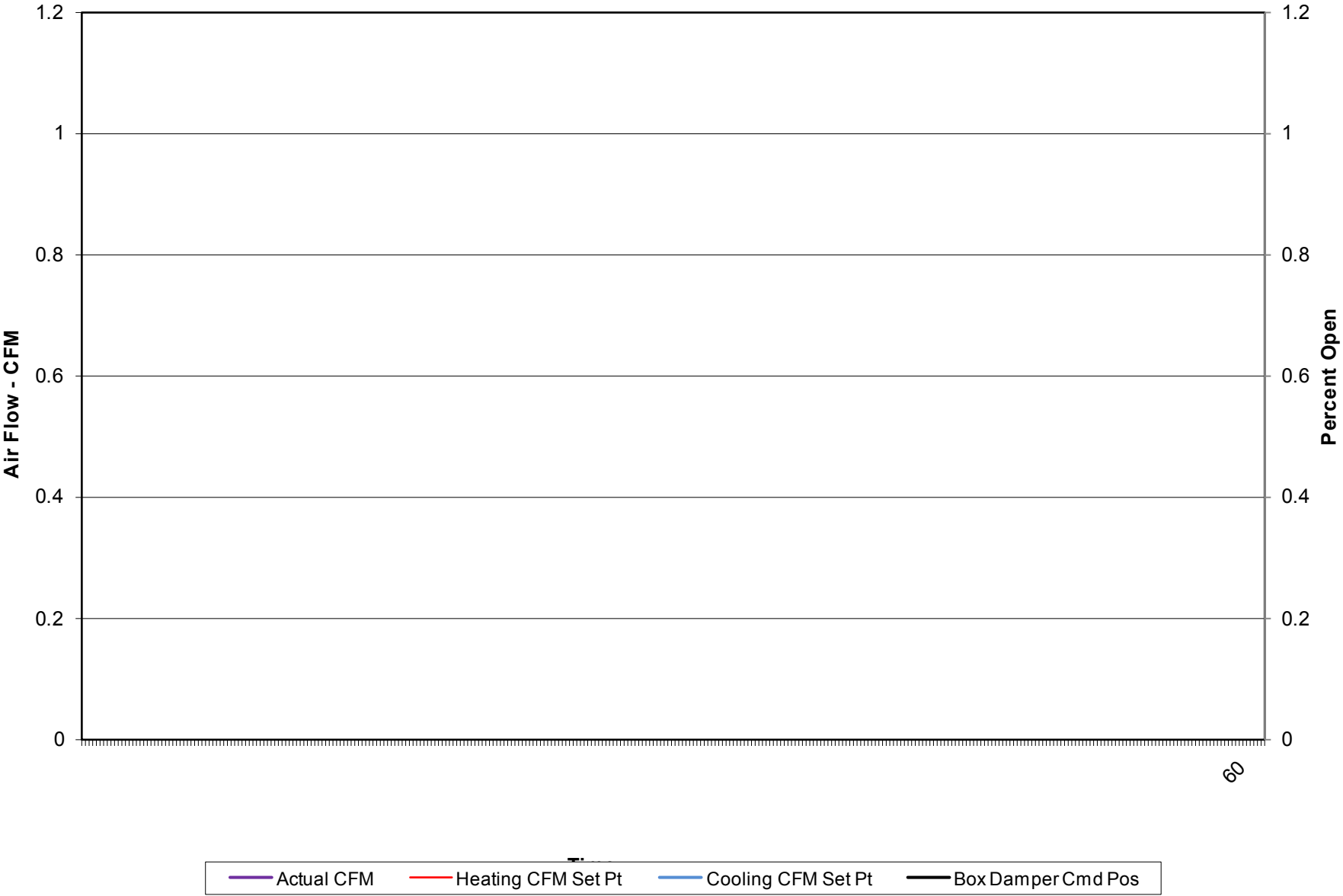
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SECTION 024119
SELECTIVE DEMOLITION

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. Demolition and removal of selected portions of building or structure.
- 2. Demolition and removal of selected site elements.
- 3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

- 1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
- 2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
- 3. Section 017300 "Execution" for cutting and patching procedures.
- 4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements
- 5. Section 017419 "Construction and Demolition Waste Management."

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing condition, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at the Project Site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.
 - 6. Review Section 017419 "Construction and Demolition Waste Management" for actions required prior to demolition.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure on-site operations to existing buildings are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.

- 4. Use of elevator and stairs.
- 5. Coordination of Owner's continuing occupancy of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- E. Pre-demolition Photographs or Video: Submit before Work begins.
- F. Statement of Refrigerant Recover: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.8 Quality Assurance

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect/Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
 3. Retain subparagraph below if hazardous materials are known to be present. Delete if Owner does not have, or will not provide, material safety data sheets for these materials.
 4. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- F. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.
- G. Storage or sale of removed items or materials on-site is not permitted.
- H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with all local, state, and federal regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform survey as the Work progresses to detect hazards resulting from selective demolition activities.
 - 2. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or preconstruction videotapes, and/or field-located surveys and provide information to Owner.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

- a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove requirement.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment and deliver to Owner.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- 1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

- 1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.

- 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain adequate ventilation when using cutting torches.
 - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 9. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction and Demolition Waste Management."

- B. Work in Historic Areas: Selective demolition may be performed only in areas of the Project that are not designated as historic. In historic spaces, areas, and rooms or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling".

- C. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.

- D. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

E. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, cleaned, and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings. Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 2. Remove existing roofing system down to substrate.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Coordinate first subparagraph below with use of elevators, stairs, or building entries permitted by building manager.
 - 4. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 5. Comply with requirements specified in Section 017419 "Construction and Demolition Waste Management."
- B. Burning: Do not burn demolished materials.
- C. Burning: Burning of demolished materials will be permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Transport demolished materials and dispose of at designated spoil areas on Owner's property
- E. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.8 SELECTIVE DEMOLITION SCHEDULE

- A. Existing Items to Be Removed: See construction drawings.
- B. Existing Items to Be Removed and Salvaged: See construction drawings.
- C. Existing Items to Be Removed and Reinstalled: See construction drawings.
- D. "Existing Items to Remain" Paragraph below may be used to inform Contractor of items that are to remain, such as those that occur in, or are adjacent to, construction being demolished, but are not being removed and reinstalled. Retain paragraph if required.
- E. Existing Items to Remain: See construction drawings.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION 024119

**SECTION 03 1000
CONCRETE FORMWORK**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section includes the design and erection of formwork, shoring and reshoring for cast-in-place concrete and accessories.

1.2 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 03 2000 - Concrete Reinforcement.
- C. Section 03 3000 - Cast-in-Place Concrete.

1.3 REFERENCES

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
- B. ACI 301 - Standard Specifications for Structural Concrete.
- C. ACI 318 - Building Code Requirements for Structural Concrete.
- D. ACI 347 - Recommended Practice for Concrete Formwork.
- E. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- F. ASTM E1643-09 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact With Earth or Granular Fill Under Concrete Slabs.
- G. ASTM E1745-09 - Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

1.4 SUBMITTALS

- A. Submit locations of construction joints for approval.
- B. Submit manufacturer's data for waterstops.

1.5 DESIGN OF FORMWORK

- A. Design of formwork, shoring, and reshoring and its removal is the sole responsibility of the Contractor.
- B. Design of formwork, shoring, and reshoring shall conform to ACI 117, ACI 301, ACI 318, and ACI 347.
- C. Design formwork in a manner such that existing or new construction is not overloaded.
- D. The formwork engineer shall verify adequate structural stability exists for intermediate pours on a given floor when developing a re-shoring plan. Any unstable areas must remain fully shored until the total elevated floor area has been completed and achieved required concrete strength (tendons fully stressed as well if PT slab/beam system).

- E. Do not remove shores earlier than recommended by ACI 301 and ACI 347.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Construct forms with wood, plywood, metal, fiberglass or a combination of these.
- B. Form materials shall have sufficient strength to prevent distortion.

2.2 FORMWORK ACCESSORIES

- A. Formwork accessories that are embedded in concrete, including ties and hangers, shall be commercially manufactured products. Do not use nonfabricated wire form ties.

2.3 FORM RELEASE AGENT

- A. Form release agent shall not bond with, stain, nor adversely affect concrete surfaces.

2.4 WATERSTOPS

- A. Waterstops at construction joints and control joints indicated by the Drawings shall be sized to suit the joints.
- B. Waterstops shall be preformed plastic adhesive waterstops as manufactured by SYNKO-FLEX Products or approved equal.

2.5 VAPOR RETARDER

- A. Vapor retarder shall consist of a material having a permeance rating of 0.100 perm or less, when tested in accordance with ASTM E1745, and not less than ten mils thick.

2.6 PREFORMED EXPANSION JOINT FILLER

- A. Asphalt impregnated premolded fiberboard expansion joint filler shall conform with ASTM D1751 and be 1/2-inch thick by full thickness of slab or joint, unless indicated otherwise on the Drawings.

2.7 CONSTRUCTION JOINTS

- A. Provide key type steel forms by Vulcan screed joints, Burke Keyed Kold joint form or approved equal.

2.8 STAY IN PLACE FORMWORK

- A. Stay in place formwork shall be one of the following approved products:
 - 1. Dayton Superior Metal Rib as manufactured by Dayton Superior
 - 2. Stay-Form as manufactured by Amico

PART 3 - EXECUTION

3.1 GENERAL

- A. Erect formwork in accordance with ACI 301, ACI 318, and ACI 347.
- B. Maintain formwork and shoring to support loads until such loads can be supported by concrete structure.

3.2 TOLERANCES

- A. Finished work shall comply with ACI 117 tolerances.

3.3 SURFACE PREPARATION

- A. For concrete exposed to view, seal form joints to prevent leakage.
- B. Before reinforcement is placed, coat contact surfaces of form with form release agent in accordance with manufacturer's recommendations. Do not allow excess form release agent to accumulate in forms or come in contact with concrete surfaces against which fresh concrete will be placed.

3.4 CHAMFERS

- A. Provide 3/4-inch chamfer at all formed corners.
- B. Chamfers are not required for concrete tie-beams and tie-columns embedded in CMU walls.

3.5 FOUNDATION ELEMENTS

- A. Form foundation elements if soil or other conditions are such that earth trench forms are unsuitable.
- B. Sides of foundation walls and turned-down slabs shall be formed.
- C. Maintain minimum coverage of reinforcing steel as indicated on Structural Drawings.

3.6 INSERTS

- A. Install and secure in position required inserts, hangers, sleeves, anchors, and nailers.
- B. Locate anchor bolts by using templates with two nuts to secure in position.

3.7 EMBEDS

- A. Set and secure embedded plates, bearing plates, and anchor bolts in accordance with approved setting drawings and in such a manner to prevent displacement during placement of concrete.

3.8 VAPOR RETARDER

- A. Install Vapor Retarder to resist the transmission of water vapor through the exterior envelope.
- B. Where indicated on Drawings, place vapor retarder over sewer and piping, but below conduits and ducts, and behind insulation and expansion joints at sidewalls.
- C. Place, protect and repair vapor retarder in accordance with ASTM E1643. Lap vapor retarder six inches minimum at splices, sealing joints as required by the manufacturer with adhesive or pressure sensitive tape or both.
- D. Do not puncture vapor retarder.
- E. Vapor Retarder shall be installed above granular sub-base.

3.9 FORM REMOVAL

- A. Remove forms carefully in such manner and at such time as to ensure complete safety of structure. Do not remove forms shoring, or reshoring until members have acquired sufficient strength to support their weight and the load thereon safely.

3.10 PROVISIONS FOR OTHER TRADES

- A. Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings and recesses from trades providing such items.
- B. Accurately place and securely support items built into forms. Obtain approval for openings not shown on Drawings.

3.11 CLEANING

- A. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed.

3.12 FORM SURFACES

- A. Coat contact surfaces of forms with a formcoating compound before reinforcement is placed. Apply in accordance with manufacturer's recommendations. Rust-stained steel formwork is not acceptable.

3.13 CONSTRUCTION JOINTS

- A. Provide construction joints in accordance with ACI 318.
- B. Obtain Architect/Structural Engineer's prior approval for use and location of joints.
- C. Unless noted otherwise on the structural drawings, provide 1-1/2 inch deep key type construction joints at end of each placement for slabs, beams, walls, and footings. Bevel forms for easy removal.
- D. Remove loose particles and latency from surface prior to placing the next lift. Chip the surface to a depth sufficient to expose sound concrete.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

**SECTION 03 2000
CONCRETE REINFORCEMENT**

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 01 4524 - Structural Testing/Inspection Agency Services.
- C. Section 03 1000 - Concrete Formwork.
- D. Section 03 3000 - Cast-in-Place Concrete.

1.2 REFERENCES

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
- B. ACI 301 - Standard Specifications for Structural Concrete.
- C. ACI 315 - Details and Detailing of Concrete Reinforcement.
- D. ACI 318 - Building Code Requirements for Structural Concrete.
- E. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
- F. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- G. ASTM A706 - Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
- H. AWS D12.1 - Recommended Practices for Welding Reinforcing Steel Metal Inserts, and Connections in Reinforced Concrete Construction.
- I. AWS D1.4 - Structural Weld Code - Reinforcing Steel.
- J. CRSI - Manual of Practice, and Documents 63 and 65.

1.3 SUBMITTALS

- A. Submit shop drawings as follows:
 - 1. Notify Structural Engineer prior to detailing reinforcing steel shop drawings.
 - 2. Indicate size, spacings, locations and quantities of reinforcing steel and wire fabric, bending and cutting schedules, splice lengths, stirrup spacing, supporting and spacing devices. Detail reinforcing steel in accordance with ACI 315 and CRSI Standards.
 - 3. Plans, details, and manufacturer data for splicers, headed shear stud reinforcement, and plate dowels as applicable to the project. Submit dowel adhesive unless already approved in the structural documents.
 - 4. Written description of reinforcement without adequate sections, elevations, and details is not acceptable.
 - 5. Reproduction of Structural Drawings for shop drawings is not permitted.

- B. Submit, for information only, a certification from each manufacturer or supplier stating that materials meet the requirements of the ASTM and ACI standards referenced.
- C. Submit, for information only, mill test reports.
- D. Submit manufacturer's data for tensile and compressive splicers.

1.4 QUALITY ASSURANCE

- A. Coordinate and schedule in a timely manner with the Structural Testing/Inspection Agency the following quality related items:
 - 1. Verify reinforcing steel for quantity, size, location, and support.
 - 2. Verify proper reinforcing steel concrete coverage.

1.5 STORAGE AND PROTECTING

- A. Store reinforcing steel above ground so that it remains clean. Maintain steel surfaces free from materials and coatings which might impair bond.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Deformed reinforcing steel shall conform to ASTM A615, refer to Structural Drawings for grade (Grade 60 minimum).
- B. Welded steel wire fabric shall conform to ASTM A1064.

2.2 ACCESSORY MATERIALS

- A. Annealed steel tie wire shall be 16-1/2 gage minimum.
- B. Bar supports shall be plastic-tipped steel Class I bar supports conforming to CRSI Specifications. Concrete brick may be used to support reinforcement to obtain proper clearance from earth.

2.3 SPLICERS

- A. Tensile splicers shall be capable of developing 125% of the reinforcing steel ASTM specified minimum yield strength.
- B. Compression splicers shall be the mechanical type such that the compression stress is transmitted by end bearing held in concentric contact.

PART 3 - EXECUTION

3.1 FABRICATION

- A. Fabricate steel in accordance with ACI 318 and CRSI standards.
- B. Bend bars cold. Do not heat or flame cut bars. No field bending of bars partially embedded in concrete is permitted, unless specifically approved by Structural Engineer and checked by Testing and Inspection Agency for cracks.
- C. Weld only as indicated. Perform welding in accordance with AWS D12.1 and or AWS D1.4.

- D. Tag reinforcing steel for easy identification.

3.2 INSTALLATION

- A. Before placing concrete, clean reinforcement of foreign particles and coatings.
- B. Place, support, and secure reinforcement against displacement in accordance with ACI 318 and CRSI standards. Do not deviate from alignment or measurement.
- C. Place concrete beam reinforcement support parallel to main reinforcement.
- D. Locate welded wire fabric in the top third of slabs. Overlap mesh one lap plus two inches at side and end joints.
- E. Furnish and install dowels or mechanical splices at intersections of walls, columns and piers to permit continuous reinforcement or development lengths at such intersections.
- F. Maintain cover and tolerances in accordance with ACI and CRSI Specifications, unless indicated otherwise on Structural Drawings.

3.3 SPLICES

- A. Do not splice reinforcement except as indicated on Structural Drawings.
- B. Tension couplers may be used and installed in accordance with manufacturer's specifications.

3.4 DOWELS IN EXISTING CONCRETE

- A. Install dowels and dowel adhesive in accordance with manufacturer's recommendations.
- B. Minimum embedment length shall be 12 bar diameters, unless noted otherwise.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

**SECTION 03 3000
CAST-IN-PLACE CONCRETE**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section includes cast-in-place concrete work indicated in the Contract Documents or otherwise required for proper completion of the work.

1.2 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 01 4524 - Structural Testing/Inspection Agency Services.
- C. Section 03 1000 - Concrete Formwork.
- D. Section 03 2000 - Concrete Reinforcement.
- E. Section 03 6200 - Non-Shrink Grout.
- F. Section 05 1200 - Structural Steel.
- G. Division 9 - Flooring and Finishes.

1.3 REFERENCES

- A. ACI 214 - Recommended Practice for Evaluation of Strength Test Results of Concrete.
- B. ACI 224.3R - Joints in Concrete Construction.
- C. ACI 233R - Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete.
- D. ACI 301 - Specifications for Structural Concrete for Buildings.
- E. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
- F. ACI 304 - Guide for Measuring, Mixing, Transporting and Placing Concrete.
- G. ACI 305 - Hot Weather Concreting.
- H. ACI 306 - Cold Weather Concreting.
- I. ACI 308 - Standard Practice for Curing Concrete.
- J. ACI 309 - Guide for Consolidation of Concrete.
- K. ACI 318 - Building Code Requirements for Structural Concrete.
- L. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- M. ASTM C33 - Standard Specification for Concrete Aggregates.
- N. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

- O. ASTM C78 - 08 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
- P. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
- Q. ASTM C138 - Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.
- R. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
- S. ASTM C150 - Standard Specification for Portland Cement.
- T. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
- U. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- V. ASTM C230 - Standard Specification for Flow Table or Use in Tests of Hydraulic Cement.
- W. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
- X. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- Y. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
- Z. ASTM C495 - Standard Test Method for Compressive Strength of Lightweight Insulating Concrete.
- AA. ASTM C618 - Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- BB. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars
- CC. ASTM E1155 - Standard Test Method for Determining Floor Flatness and Levelness Using the F-Number System.
- DD. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures
- EE. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete

1.4 NOTICE

- A. Notify Architect/Structural Engineer and Structural Testing/Inspection Agency not less than 48 hours prior to placing concrete.

1.5 QUALITY ASSURANCE

- A. Structural Testing/Inspection Agency shall perform the following quality related items:
 - 1. Examine concrete in truck to verify that concrete appears properly mixed.
 - 2. Perform a slump test as deemed necessary for each concrete load. Record if water or admixtures are added to the concrete at the job site. Perform additional slump tests after job site adjustments.
 - 3. Casting and curing of test specimens shall be in accordance with ASTM C31.
 - 4. Mold specimen sets for compressive strength testing in accordance with below table. Mold one set for each 75 cubic yards of each mix design placed in any one day. At a minimum, one set of specimens must be taken every day and one set for every 5,000 square feet of surface area for slabs or walls. For each set molded, record:
 - a. Slump

- b. Air content
- c. Unit weight
- d. Temperature, ambient and concrete
- e. Location of placement
- f. Any pertinent information, such as addition of water, addition of admixtures, etc.

Perform cylinder breaks in accordance with below table. The spare cylinders are to be broken as directed by the Structural Engineer if compressive strength does not appear adequate. The average of the concrete cylinders broken at 28 days shall be used to verify that the concrete has obtained the specified strength.

The strength level shall be considered satisfactory for a class of concrete if both of the following are met: Every average of any three consecutive tests equals or exceeds f'_c AND no strength test falls below f'_c by more than 500 psi (or by more than $0.10 f'_c$ when f'_c is more than 5,000 psi). Tests shall be as defined in Chapter 26 of ACI318-14.

Cylinder Size	No. Cylinders & Test Age
6x12	1@ 7 Days, 2 @ 28 Days, 1 Spare
4x8	1@ 7 Days, 3 @ 28 Days, 2 Spare

- 5. Report in writing, as directed by the Architect/Structural Engineer, on the same day that tests are performed. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing agency, concrete design compressive strength, location of concrete placement in structure, concrete mix proportions and materials, compressive breaking strength and type of break.
 - 6. Test concrete slabs for specified flatness and levelness in accordance with ASTM E1155.
- B. The ready-mixed concrete plant shall be certified for conformance with the requirements of the State Department of Transportation or the National Ready Mix Concrete Association.

1.6 EXPOSURE CATEGORIES AND CLASSES

- A. Concrete elements are classified by exposure in accordance with Table 19.3.1.1 of ACI 318-14. Refer to drawings for classes and strengths of concrete required.

1.7 CONCRETE MIX DESIGN

- A. Establish concrete mix design proportions in accordance with ACI 318-14, Chapter 19 and 26.
- B. Submit concrete mix designs. Include the following:
- 1. Type and quantities of materials.
 - 2. Slump.
 - 3. Air content.
 - 4. Fresh unit weight.
 - 5. Aggregates sieve analysis.
 - 6. Design compressive strength.
 - 7. Location of placement in structure.
 - 8. Method of placement.
 - 9. Method of curing.
 - 10. Expected minimum strengths of the concrete at the specified testing frequencies (7 and 28 days) noted in section 1.05 A 4.
 - 11. Waterproofing Admixture
- C. Concrete supplier shall submit certifications that the materials used meet applicable ASTM Specifications. Mix designs not conforming to the above will be rejected.

- D. Submit verification from the concrete admixture supplier that the concrete mix conforms to their requirements for the waterproofing admixture. Concrete supplier shall coordinate the mix design with the waterproofing admixture supplier prior to the concrete mix submittal.

1.8 SLUMP

- A. Design concrete with a maximum slump of five inches.
- B. If a slump greater than five inches is desired it shall be achieved with a high-range water reducer. The maximum slump after high-range water reducers are added shall be eight inches.

1.9 FRESH UNIT WEIGHT

- A. Normal weight concrete shall have a fresh unit weight of 140 to 152 pcf.

1.10 AIR CONTENT

- A. Tolerance
 - 1. Air content includes both entrained and entrapped air and shall be within +/- 1.5% of the values indicated below.
- B. Normal Weight Concrete
 - 1. Normal weight concrete does not require any air content unless the concrete is in Exposure Class F1, F2, or F3.

1.11 WATER/CEMENT RATIO

- A. Concrete elements are classified by exposure in accordance with Table 19.3.1.1 of ACI 318-14. See Structural Notes for specific classifications and associated Water/Cement Ratios for the subject project.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials designated by specific manufacturer's trade names are approved, subject to compliance with the quality and performance indicated by the manufacturer. Instructions and specifications, published by the manufacturer of such materials are included in and are a part of these specifications. Upon request, provide certification from manufacturer or supplier that materials designated by reference to ASTM and ACI standards meet the requirements of these standards.

2.2 CONCRETE STRENGTH

- A. Provide concrete strengths indicated on the Structural Drawings.

2.3 CEMENT

- A. Portland cement shall conform to ASTM C150. Use one brand only.
- B. For concrete in Exposure Class S0, use Type I, unless noted otherwise.
- C. For concrete in Exposure Class S1, use Type II with moderate sulfate resistance, unless noted otherwise.
- D. For concrete in Exposure Class S2, use Type V, unless noted otherwise.

- E. For concrete in Exposure Class S3, use Type V combined with either pozzolan or slag, unless noted otherwise.

2.4 AGGREGATE

- A. Fine aggregate shall conform to ASTM C33.
- B. Coarse aggregate of gravel or crushed stone shall conform to ASTM C33. Size coarse aggregate in accordance with ACI 318 and within the limitations set forth in the Structural Drawings.
- C. See Structural Drawings for specific classifications and associated maximum aggregate size.

2.5 WATER

- A. Water shall be potable and free of deleterious substances in accordance with ACI 318.

2.6 AIR ENTRAINING AGENT

- A. Air entraining agent shall conform to ASTM C260.

2.7 WATER REDUCER

- A. Water reducing agent shall conform to ASTM C494.

2.8 HIGH-RANGE WATER REDUCER

- A. High-range water reducers (superplasticizers) shall conform to ASTM C494.

2.9 CURING COMPOUND

- A. An acrylic, water based, "odorless" cure compound may be used at the Contractor's option in accordance with ASTM C309 or ASTM C1315, and in compliance with these specifications.

2.10 FLY ASH

- A. Fly ash shall be Class F fly ash with a loss on ignition of less than five percent or Class C fly ash with a loss on ignition of less than one percent in accordance with ASTM C618.
- B. Maximum fly ash content shall be limited to 20% of the total cementitious material weight.

2.11 GROUND GRANULATED BLAST-FURNACE SLAG (GGBFS).

- A. Ground Granulated Blast-Furnace Slag (GGBFS) shall conform to ASTM C989 and ACI 233.
- B. Maximum GGBFS content shall be limited to 50% of the total cementitious material weight. Maximum total combined GGBFS plus Fly ash shall be limited to 50% of the total cementitious material weight.

2.12 SILICA FUME

- A. Silica Fume shall conform to ASTM C1240.
- B. Maximum Silica Fume content shall be limited to 10% of the total cementitious material weight. Maximum total combined Silica Fume, GGBFS, and Fly ash shall be limited to 50% of the total cementitious material weight.

2.13 ACCELERATORS

- A. Non-chloride accelerators shall conform to ASTM C494.

2.14 RETARDERS

- A. Retarders shall conform to ASTM C494.

2.15 WATERPROOFING ADMIXTURE

- A. Admixture shall be Concure Waterproofing Admixture or approved equal.
- B. Admixture must be compatible with pumpability and concrete finishing requirements, in addition to the finished flooring.

2.16 CONTRACTION JOINT SEALANT

- A. Semi-rigid, epoxy joint filler. Sealer must be compatible with Division 9 flooring installation preparation.

2.17 CALCIUM CHLORIDE AND CHLORIDE ION CONTENT

- A. Calcium chloride or admixtures containing more than 0.5% chloride ions by weight of the admixture are not permitted.
- B. The maximum water-soluble chloride ion concentration in hardened concrete at ages from 28 to 42 days contributed from all ingredients including water, aggregates, cementitious materials, and admixtures shall not exceed the limits specified in Table 19.3.2.1 of ACI 318-14. Water-soluble chloride ion tests shall conform to ASTM C 1218. One test shall be run for each class of concrete before the mix design submittal and each time a change is made to the mix design (such as change in aggregate type or source).
- C. The Concrete Supplier shall certify on the Mix Design Submittal Form that the chloride ion content in all concrete mix designs used on the project does not exceed the limits stated above.

PART 3 - EXECUTION

3.1 HIGH-RANGE WATER REDUCERS

- A. High-range water reducers are to be added at dosage recommended by the manufacturer. The slump of the concrete shall be one to four inches at the time the high-range water reducers are added. Do not permit fresh concrete containing superplasticizers to come in contact with fresh concrete not containing superplasticizers.

3.2 ADDITION OF WATER AT JOB SITE

- A. Water may be added to the batch only if neither the maximum permissible water/cement ratio nor the maximum slump is exceeded.
- B. The superintendent or his designated representative may only add water to the concrete batch if the batching plant has noted on the trip ticket the maximum amount of water that may be added on site.

3.3 TEST SLAB

- A. Provide a minimum 400 square foot test slab when pumping of concrete is proposed to demonstrate pumpability and finishing of concrete.

- B. Test slab shall be moist cured.
- C. Use the same concrete mix, placement and finishing equipment as to be used for the regular placements.

3.4 PLACEMENT OF CONCRETE

- A. Deposit concrete as near as practical to final position. Maximum free fall shall be six feet.
- B. Do no flowing of concrete with vibrators.
- C. Place floors and slabs in accordance with ACI 302.
- D. Place thickened slabs for partitions integral with floor slabs.
- E. Prepare place of deposit, mix, convey, place, and cure concrete in accordance with ACI 301, ACI 304, and ACI 318. Wet forms before placing concrete.

3.5 TIME LIMIT

- A. Deposit concrete within one and one-half hours after batching.

3.6 VIBRATION

- A. Consolidate concrete in accordance with ACI 301 and ACI 309.

3.7 CURING

- A. Begin curing procedures immediately following the commencement of the finishing operation.
- B. Cure concrete in accordance with ACI 308. Keep the concrete surface moist. Moist cure slabs with a clear, polyethylene vapor barrier to maintain a moist surface. Do not over wet concrete surface. For vertical surfaces, elevated slabs, and slabs on grade that do not receive a finished floor an acrylic curing compound is used, apply in accordance with manufacturer's recommendations to surfaces of concrete not protected for five days by formwork. Do not use curing compounds in areas to receive material that does not adhere to concrete cured with a curing compound unless the curing compound is water soluble.

3.8 SLAB ON GRADE

- A. Concrete used in slabs on grade shall exhibit ultimate shrinkage strain no more than 0.05 percent. If tests were required to meet this criteria, concrete shrinkage tests shall be performed in accordance with ASTM C 157 on specimens moist-cured for one day. Tests shall be performed by an ACI certified technician in an ACI certified laboratory.

3.9 ENVIRONMENTAL PROVISIONS

- A. Perform cold weather concreting in accordance with ACI 306.
- B. Perform hot weather concreting in accordance with ACI 305.
- C. Protect concrete from drying and excessive temperature for the first seven days.
- D. Protect fresh concrete from wind.

3.10 CONTRACTION JOINTS

- A. Obtain Architect/Structural Engineer's approval for location of contraction joints.
- B. Do not place contraction joints in framed floors or composite slabs.
- C. Place contraction joints in slabs-on-grade as indicated on the Drawings.
- D. Provide contraction joints in concrete walls at approximately 20-foot centers; coordinate location with Architect and Engineer. Contraction joints shall be formed as a V-groove on both faces of the wall, 3/4-inch minimum depth.
- E. Remove dirt and debris from joints. Joints shall be dry and free from all substances that inhibit bond. Install sealant to prevent three-sided bonding. Coordinate sealant installation with the application of the flooring and Division 9 specifications.

3.11 CUTTING CONCRETE

- A. Obtain Architect/Structural Engineer's written approval prior to cutting concrete for installation of other work.

3.12 PATCHWORK AND REPAIRS

- A. Notify Architect/Structural Engineer of any defective areas in concrete to be patched or repaired. Repair and patch defective areas with non-shrink grout. Cut out defective areas over two inches in diameter to solid concrete, but not less than a depth of one inch. Make edges of cuts perpendicular to the concrete surface.

3.13 DEFICIENT CONCRETE COMPRESSIVE STRENGTH

- A. In the event that concrete tests indicate a 7-day or 28-day strength below that which was expected or specified, the Contractor with the agreement of the Architect/Engineer shall have the mix adjusted so that subsequent concrete will comply with the minimum strength requirements. The Owner may require core specimens to be taken and tested, at the Contractor's expense. If core tests fall below minimum requirements, as determined by the Architect/Engineer, the concrete in place will be deemed to be defective. This concrete shall be removed and replaced or strengthened in a manner acceptable to the Owner and Architect/ Engineer, at the Contractor's expense. Any demolition or repair of other materials or systems as a result of repair or replacement of defective concrete shall be at the Contractor's expense.

3.14 CONCRETE FINISHES

- A. Finish concrete in accordance with ACI 301, ACI 117, and ACI 302.1.
- B. Finish concrete slabs to flatness and levelness tolerances which correspond to FF 25/FL 20 minimum overall for composite of all measured values per placement and FF 17/FL 15 minimum for any individual floor section.
- C. For concrete slabs to receive owner furnished equipment, finish to floor flatness and floor levelness tolerances stated in the equipment manufacturer's recommended guidelines.
- D. For shored construction, FL values do not apply if slab is tested after shoring is removed.
- E. For unshored construction, FL does not apply.
- F. Slabs which do not meet the flatness and levelness criteria shall be repaired or replaced.

3.15 ARCHITECTURAL CONCRETE

- A. Patch all form-tie holes and all depressions, voids or other defects with similarly-colored non-shrink grout.
- B. Painted Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform texture. Apply paint to smooth finished concrete. See Architectural Finishes for paint specifications.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

**SECTION 03 5400
CAST UNDERLAYMENT**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Liquid-applied floor underlayment to create floor slopes in shower rooms.

1.2 RELATED REQUIREMENTS

- A. Section 01 7000 - Execution and Closeout Requirements: Alteration project procedures; selective demolition for remodeling.

1.3 REFERENCE STANDARDS

1.4 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation, mixing instructions, environmental limitations, storage and handling requirements, and installation instructions.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Instructions.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.7 FIELD CONDITIONS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.
- B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.
- C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cast Underlayments, General:
- B. Comply with applicable code for combustibility or flame spread requirements.
- C. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
 - 1. Compressive Strength: Minimum 4000 pounds per square inch after 28 days, tested per ASTM C109/C109M.

2. Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
 3. Density: 125 pounds per cubic foot, nominal.
 4. Final Set Time: 1-1/2 to 2 hours, maximum.
 5. Thickness: Capable of thicknesses from feather edge to maximum [] inch.
 6. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.
- D. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.
- E. Reinforcement: Galvanized metal lath complying with recommendations of underlayment manufacturer for specific project circumstances.
- F. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.
- G. Primer: Manufacturer's recommended type.
- H. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.
- I. MIXING
1. Site mix materials in accordance with manufacturer's instructions.
 2. Add aggregate for areas where thickness will exceed 1/2 inch. Mix underlayment and water for at least two minutes before adding aggregate, and continue mixing to assure that aggregate has been thoroughly coated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.2 PREPARATION

- A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.
- B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.
- C. Vacuum clean surfaces.
- D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

3.3 APPLICATION

- A. Install underlayment in accordance with manufacturer's instructions.
- B. Pump or pour material onto substrate. Do not retemper or add water.
1. Pump, move, and screed while the material is still highly flowable.
 2. Be careful not to create cold joints.
 3. Wear spiked shoes while working in the wet material to avoid leaving marks.
- C. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.
- D. For final thickness over 1-1/2 inches, place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours.
- E. Place before partition installation.

F. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.

G. If a fine, feathered edge is desired, steel trowel the edge after initial set, but before it is completely hard.

3.4 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

A. An independent testing agency will perform field inspection and testing, as specified in Section 01 4000 - Quality Requirements.

B. Placed Material: Agency will inspect and test for compliance with specification requirements.

3.6 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 03 6200
NON-SHRINK GROUT**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section includes non-shrink grout under base plates, bearing plates, or as otherwise required by the structural engineer-of-record.

1.2 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 01 4524 - Structural Testing/Inspection Agency Services.

1.3 REFERENCES

- A. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens).
- B. ASTM C1107 – Standard Specification For Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)

1.4 QUALITY ASSURANCE

- A. Structural Testing/Inspection Agency shall perform the following quality related items:
 - 1. Perform compressive strength tests in accordance with ASTM C109 with 2-inch x 2-inch cubes. Test one cube at three days, two cubes at seven days and three cubes at 28 days. Perform one compressive strength test for each ten bags of grout used and/or perform one test minimum for each day of grouting, whichever is more frequent.

1.5 SUBMITTALS

- A. Submit product data sheets for review.

PART 2 - PRODUCTS

2.1 GROUT

- A. Provide a non-shrink, non-metallic grout that complies with ASTM C1107.
- B. Grout shall have a minimum compressive strength of 6000 psi at 28 days.
- C. Grout placed in exterior exposed conditions or areas subject to moisture shall be free of gypsum.

2.2 WATER

- A. Provide clean, potable water.

PART 3 - EXECUTION

3.1 HANDLING

- A. Store and protect non-shrink grout from moisture and contamination.

3.2 PREPARATION

- A. Remove mud, dirt and other foreign materials from areas to be grouted.
- B. Apply grout to rough concrete surface; roughen concrete as necessary prior to placing grout.

3.3 MIXING

- A. Mix grout to its fluid, self-leveling consistency in accordance with manufacturer's recommendations. Do not retemper grout. Do not exceed manufacturer's maximum limit on water content or use at a consistency which produces free bleeding. Mix grout in a paddle-type mortar mixer. Do not mix by hand.

3.4 PLACEMENT

- A. Consolidate grout to provide uniformity. Do not vibrate grout.
- B. Use forms to contain grout.

3.5 PROTECTION

- A. Protect grout and areas to be grouted from excessive heat and cold in accordance with manufacturer's specifications. Protect grout from excessive drying shrinkage resulting from wind or direct sunlight. Protect areas grouted from excessive vibrations for three days.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

**SECTION 04 2200
STRUCTURAL CONCRETE MASONRY**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section includes structural concrete masonry shown on the Structural Drawings.

1.2 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 01 4524 - Structural Testing/Inspection Agency Services.
- C. Section 03 2000 - Concrete Reinforcement.
- D. Section 03 3000 - Cast-in-Place Concrete.
- E. Section 04 2000 - Unit Masonry.

1.3 REFERENCES

- A. ACI 530.1/ASCE 6/TMS 602 - Specifications for Masonry Structures.
- B. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- C. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
- E. ASTM A884 - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement
- F. ASTM A951 - Standard Specification for Masonry Joint Reinforcement.
- G. ASTM C90 - Standard Specification for Load bearing Concrete Masonry Units.
- H. ASTM C91 - Standard Specification for Masonry Cement.
- I. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).
- J. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
- K. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
- L. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
- M. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
- N. ASTM C476 - Standard Specification for Grout for Masonry.

- O. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
- P. ASTM C1314 - Standard Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry
- Q. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.

1.4 SUBMITTALS

- A. Submit mortar mix design including type of cement used.
- B. Submit coarse grout mix design.
- C. Submit material certificates signed by the material supplier that the masonry units, mortar, reinforcement, and joint material complies with specification requirements.
- D. Submit shop drawings for masonry reinforcement in accordance with Section 03 2000.
- E. Submit procedures for construction of masonry walls to be filled with coarse grout. Procedures should include high lift or low lift grouting as applicable to project.

1.5 QUALITY ASSURANCE

- A. Structural Testing/Inspection Agency shall perform the following quality related items:
 - 1. Verify reinforcing steel for quantity, size, and location.
 - 2. Verify placement of coarse grout as indicated in high or low lift procedure.
 - 3. Verify compressive strength of concrete masonry units, mortar, coarse grout, or masonry prisms for each 10,000 sq. ft. of surface area as follows:
 - a. Concrete masonry units shall be tested in accordance with ASTM C140.
 - b. Six (6) mortar cube specimens shall be tested, three (3) at 7-days and three (3) at 28-days, in accordance with ASTM C109.
 - c. Six (6) coarse grout specimens shall be tested, three (3) at 7-days and three (3) at 28-days, in accordance with ASTM C1019.
 - d. In lieu of individual tests of masonry units, mortar, and grout, if directed by the Architect/Structural Engineer, perform one (1) prism test (which consists of three prisms) in accordance with ASTM C1314.

1.6 HANDLING OF MATERIALS

- A. Package, handle, and store materials to protect from elements and prevent contamination.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY

- A. Concrete masonry shall have the minimum compressive strength (f_m) specified on the Drawings.

2.2 CONCRETE MASONRY UNITS

- A. Concrete masonry units shall conform to ASTM C90.
- B. Provide normal weight concrete masonry units.

- C. Concrete masonry units shall have, as a minimum, the net area compressive strength listed in Table 2 of ACI 530.1/ASCE 6/TMS 602 required for the specified f_m .
- D. Provide standard units with face dimensions of 16" long x 8" high nominal, unless indicated otherwise.
- E. Provide special shapes where indicated on the Drawings.

2.3 MORTAR

- A. Mortar shall be Type S in accordance with the proportion specification requirements of ASTM C270.
- B. Do not use admixtures that contain chlorides.

2.4 COARSE GROUT

- A. Coarse grout shall conform to ASTM C476.
- B. Coarse grout shall have the minimum compressive strength specified on the Drawings.
- C. Mix grout to a consistency which has a slump between 8 and 10 inches.
- D. Do not use admixtures that contain chlorides.

2.5 WATER

- A. Provide clean potable water free of deleterious substances.

2.6 REINFORCEMENT

- A. Horizontal and vertical reinforcing bars shall comply with Section 032000.

2.7 HORIZONTAL JOINT REINFORCEMENT

- A. Provide horizontal joint reinforcement that conforms to ASTM A951. Horizontal joint reinforcement shall be manufactured with longitudinal parallel, deformed side wires of the size specified on the drawings. Cross wires shall be No. 9 gage, plain, in accordance with ASTM A82.
- B. Provide as a minimum, one side wire for each face shell of hollow masonry units. Provide additional side wires or eye sections for adjustable wall ties as specified for multiwythe wall construction.
- C. Provide truss type joint reinforcement, except ladder type reinforcement shall be used for walls with vertical reinforcement.
- D. Horizontal joint reinforcement shall be hot-dipped galvanized in accordance with ASTM A153, Class B-2.
- E. Provide prefabricated corner and tee shape corner accessories.

2.8 CONTRACTION (CONTROL) JOINT MATERIAL

- A. Contraction (Control) joint material shall comply with ASTM D2000, M2AA-805 with rubber shear keys with a minimum durometer hardness of 80.

PART 3 - EXECUTION

3.1 MIXING

- A. Except as otherwise approved for small batches, mix in mechanically operated batch mixers of drum type in which water can be accurately and uniformly controlled. Mortar materials shall be placed in the mixer in a similar manner from batch to batch, in the following order: place 3/4 of the required water, 1/2 of the required sand, and all of the cementitious materials into the mixer and mix briefly. Add the balance of the sand. Add the balance of the water as the mortar is mixed and begins to stiffen. Total mixing time shall be a minimum of 3 minutes and a maximum of 5 minutes. Do not permit volume of batch to exceed manufacturer's rated capacity of mixer drum. Empty drum completely before placing next batch. Keep mixers and wheelbarrows clean. Do not deposit mortar upon or permit contact with ground.
- B. Do not use anti-freeze compounds.

3.2 CONSTRUCTION

- A. Use dry masonry units. No frozen or wet units shall be used.
- B. Discard cracked, chipped, and spalled masonry units.
- C. Deliver mortar to mason's board at point of use within 45 minutes after mixing. Do no retempering. Use no admixtures. Discard all mortar which has begun to stiffen or is not used within 2 1/2 hours after initial mixing. Use pre-hydrated mortar for tuck points. Prepare pointing mortar with as dry consistency as will produce mortar sufficiently plastic to be worked into joints.
- D. During erection cover top of wall with strong waterproof membrane at end of each day when shutdown. Cover partially completed walls when work is not in progress. Extend and secure cover a minimum of 24 in. down both sides. Do not apply uniform floor or roof loading for at least 12 hours after building masonry columns or walls. Do not apply concentrated loads for at least 3 days after building masonry columns or walls.
- E. Provide temporary bracing during erection as required to stabilize erected masonry.
- F. Except where otherwise indicated, lay block in running bond.
- G. Before placement of grout in masonry units, remove all mortar droppings, projections larger than 1/2 inch and debris from cores, reinforcement and foundation or bearing surface.
- H. For low-lift grouting, pour height shall not exceed five (5) feet. For all lifts except the final, the level of grout being placed shall be stopped at an elevation of 1 1/2 inches below the top bed joint to form a shear key for the successive lift.
- I. For high-lift grouting, provide cleanouts for removal of debris at the bottom of all cores containing reinforcement for partially grouted walls and at a maximum spacing of 32 inches on center for fully grouted walls. Cleanouts shall have a minimum opening dimension of 3 inches. Delay grouting until mortar has cured sufficiently to prevent horizontal movement (blowout) of the units.
- J. Consolidate all grout pours with a mechanical vibrator upon placement. Reconsolidate after a waiting period of 3 to 10 minutes. Top off all grouted cells after reconsolidation.

3.3 PLACING AND BONDING

- A. Hollow masonry units shall be placed such that face shells of bed joints are fully mortared. Webs shall be fully mortared in all courses of piers, columns, pilasters, in the starting course on foundations, where

adjacent cells or cavities are to be grouted, and where otherwise indicated. Head joints shall be mortared a minimum distance from each face equal to the face shell thickness of the unit.

- B. Unless otherwise required or indicated on the construction drawings, solid masonry units shall be placed in fully mortared bed and head joints. The ends of the units shall be completely buttered. Head joints shall not be filled by slushing with mortar. Head joints shall be constructed by shoving mortar tight against the adjoining unit. Bed joints shall not be furrowed deep enough to produce voids.
- C. Unless otherwise required or indicated on the construction drawings, head and bed joints shall be 3/8 inch thick, except that the thickness of the bed joint of the starting course placed over the foundations shall not be less than 1/4 inch and not more than 3/4 inch.
- D. Fully bond external corners of concrete block. Where interior block partitions intersect other block walls or partitions, provide control joints with mortar raked back 1/4 inch.
- E. Isolate masonry partitions from vertical structural framing members with control joints, with mortar raked back 1/4 inch.

3.4 CONTRACTION (CONTROL) JOINTS

- A. Install contraction (control) joints at locations indicated on the drawings in all masonry walls. Nonstructural reinforcement, such as horizontal joint reinforcement, shall not be continuous through contraction (control) joints. Structural reinforcement, such as bond beam reinforcement, shall be continuous through contraction (control) joints.

3.5 TOLERANCES

- A. Variation from Unit to Adjacent Unit: 1/32 inch maximum.
- B. Variation from Plan of Wall: Maximum 1/4 inch in 10 feet, and 1/2 inch in 20 feet or more.
- C. Variation from Plumb: +/- 1/4 inch in 10 feet, +/- 3/8 inch in 20 feet; +/- 1/2 inch maximum.
- D. Variation in Level Coursing: +/- 1/4 inch in 10 feet; +/- 1/2 inch maximum.
- E. Variation in Joint Thickness: +/- 1/8 inch Maximum.

3.6 CLEANING AND POINTING

- A. Dry brush masonry surfaces before mortar has set hard to remove mortar crumbs and accumulation.
- B. Clean masonry with commercial brick cleaner approved by brick manufacturer. Protect other work from cleaning materials.
- C. Cut out defective mortar and repoint.

3.7 HORIZONTAL JOINT REINFORCEMENT

- A. Place horizontal joint reinforcement in the horizontal mortar beds at spacings as noted in the Drawings, except as specified herein.
- B. For masonry below grade, space horizontal joint reinforcing at 8 inches vertically.
- C. Above lintels and below sills at openings, place a continuous run of horizontal joint reinforcement in the first two bed joints, 8 inches apart. Extend joint reinforcement two feet beyond opening.

- D. Joint reinforcement shall be continuous, except it shall not pass through vertical masonry contraction joints. Lap joint reinforcement a minimum of 6 inches.

3.8 ENVIRONMENTAL PROVISIONS

- A. Cold weather masonry construction shall comply with "Recommended Practices and Guide Specifications for Cold Weather Masonry Construction, Section 04200" by the International Masonry All-Weather Council.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

**SECTION 05 1200
STRUCTURAL STEEL**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section includes fabrication and erection of structural steel indicated in the Contract Documents or otherwise required for proper completion of the work.

1.2 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 01 4524 - Structural Testing/Inspection Agency Services.
- C. Section 05 3000 - Steel Decking.

1.3 REFERENCES (CURRENT EDITION ADOPTED BY THE BUILDING CODE USED FOR THE PROJECT DESIGN AS LISTED IN THE STRUCTURAL DRAWINGS)

- A. AISC (American Institute of Steel Construction)
 - 1. Specification for Structural Joints Using High-Strength Bolts
 - 2. 303 - Code of Standard Practice for Steel Buildings and Bridges
 - 3. Manual of Steel Construction
- B. ANSI (American National Standards Institute) / AISC (American Institute of Steel Construction)
 - 1. 360 - Specification for Structural Steel Buildings
- C. AWS (American Welding Society)
 - 1. A5.1 - Specification for Carbon Steel Electrodes for Shield Metal Arc Welding
 - 2. A5.17 - Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding
 - 3. A5.20 - Specification for Carbon Steel Electrodes for Flux Cored Arc Welding
 - 4. A5.5 - Specification for Low-Alloy Steel Covered Arc Welding Electrodes
 - 5. D1.1 - Structural Welding Code
- D. ASTM (American Society for Testing and Materials)
 - 1. Structural Shapes Plates and Bars
 - a. A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
 - b. A29 - Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought
 - c. A36 - Standard Specification for Carbon Structural Steel
 - d. A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 - e. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
 - f. A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
 - g. A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
 - h. A913 - Standard Specification for High-Strength Low-Alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-Tempering Process (QST)
 - i. A992 - Standard Specification for Structural Steel Shapes

- j. A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
- k. A1085 - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)
- 2. Structural Fasteners
 - a. A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - b. A194 - Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
 - c. A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength
 - d. A563 - Standard Specification for Carbon and Alloy Steel Nuts
 - e. F436 - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions
 - f. F844 - Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use
 - g. F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series
 - h. F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
 - i. F3125 - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength
- 3. Other
 - a. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - b. A673 - Standard Specification for Sampling Procedure for Impact Testing of Structural Steel
 - c. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
 - d. A786 - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates
 - e. B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
 - f. F1136 - Standard Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners
 - g. F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
- E. SSPC - Steel Structures Painting Manual.
- F. Research Council on Structural Connections (RCSC) – Specification for Structural Joints Using High Strength Bolts.

1.4 SUBMITTALS

- A. Shop drawings shall be submitted for review.
 - 1. Contact Structural Engineer's Construction Administration Division prior to detailing structural steel shop drawings.
 - 2. Shop drawings shall clearly indicate the profiles, sizes, ASTM Grade, spacings and locations of all structural steel members, including connections, attachments, anchorages, framed openings, sizes and types of fasteners, method of tightening fasteners, cambers, and the number, type and spacing of the headed shear connectors.
 - 3. Reproduction of Structural Drawings for shop drawings is not permitted.
 - B. Erection drawings shall be submitted for review.
 - C. Certification that the fabricator meets the required qualifications shall be submitted.
 - D. Certification that the erector meets the required qualifications shall be submitted.
-

- E. The documents listed in Section N3.2 of ANSI/AISC 360 shall be maintained and submitted for review upon request.
- F. Shop measurements of camber shall be maintained and submitted for review upon request. Field measurements of camber shall be submitted for review.
- G. If inspections are not required at the fabricator's premises, at completion of fabrication, the approved fabricators shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.
- H. If inspections are required at the fabricator's premises, prior to delivery of structural steel to the project, inspection reports shall be submitted.
- I. Ultrasonic testing reports for complete penetration welds shall be submitted.

1.5 QUALITY ASSURANCE

- A. Qualified fabricators
 - 1. Fabricators that are both building code approved and AISC certified:
 - a. The special inspections described in section 1.05B only apply to work done in the field and are not required for work done on the premises of the fabricator.
 - b. Fabricator shall perform ultrasonic testing on 100 percent of the complete penetration welds performed in the shop. For welds less than 5/16" thick, a magnetic particle test may be performed.
 - 2. Other fabricators:
 - a. The special inspections described in section 1.05B are required for both work done in the field and work done on the premises of the fabricator.
- B. Structural Testing/Inspection Agency shall perform the following quality related items:
 - 1. Inspection of fabricators
 - a. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards.
 - b. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.
 - c. A minimum of one trip per week is recommended. The first trip should be scheduled in the early stages of fabrication.
 - d. Contact Structural Engineer prior to initial inspection.
 - 2. Fabricator and erector documents
 - a. Verify reports and certificates as listed in Section N3.2 of ANSI/AISC 360 for compliance with construction documents.
 - 3. Material verification of structural steel
 - a. The inspector shall conduct periodic inspections to verify high-strength bolts, nuts, and washers:
 - 1) Verify that the identification markings conform to the ASTM standards, specified in the approved construction documents.
 - 2) Verify the manufacturer's certificate of compliance.
 - b. The inspector shall conduct periodic inspections to verify the structural steel:
 - 1) Verify that the identification markings conform to the ASTM standards, specified in the approved construction documents.
 - 2) Verify the manufacturer's certified mill test reports.
 - c. The inspector shall conduct periodic inspections to verify the weld filler materials:
 - 1) Verify that the identification markings conform to the AWS specification, specified in the approved construction documents.

- 2) Verify the manufacturer's certificate of compliance.
4. Embedments including Anchor Bolts
 - a. Verify diameter, grade, type, length, embedment and configuration of embedments.
 - b. Expansion Anchors
 - 1) Verify proper installation in accordance with manufacturer recommendations and ICC-ES Code Report requirements. This includes, but is not limited to, verifying the location of the anchor including any edge distance and spacing requirements, drill bit type and size, hole depth, hole cleaning technique (if applicable), anchor type, size, embedment and installation procedure.
 - c. Adhesive Anchors
 - 1) Verify proper installation in accordance with manufacturer recommendations and ICC-ES Code Report requirements. This includes, but is not limited to, verifying the location of the anchor, any edge distance and spacing requirements, drill bit type and size, hole depth, hole cleaning technique (very important), anchor type, size, embedment and installation procedure including adhesive expiration date and proper dispensing.
5. Verify member locations, braces, stiffeners, and application of joint details at each connection comply with construction documents.
 - a. Camber
 - 1) Measure 25 percent of all cambered steel members (in field) prior to erection for compliance with AISC 303. Camber shall be checked at mid-point of member length.
 - 2) Additional measurements may be required at the Structural Engineer's discretion.
6. Structural steel welding:
 - a. Inspection shall be in accordance with AWS Structural Welding Code.
 - b. Inspection tasks Prior to Welding
 - 1) Observe or perform for each welded joint or member the QA tasks listed in ANSI/AISC 360, Table N5.4-1.
 - c. Inspection tasks During Welding
 - 1) Observe or perform for each welded joint or member the QA tasks listed in ANSI/AISC 360, Table N5.4-2.
 - 2) The inspector shall perform continuous monitoring of complete penetration groove welds, partial penetration groove welds, multi-pass fillet welds, and single-pass fillet welds greater than 5/16".
 - 3) The inspector shall perform periodic monitoring of single-pass fillet welds less than or equal to 5/16".
 - d. Inspection tasks After Welding
 - 1) Observe or perform for each welded joint or member the QA tasks listed in ANSI/AISC 360, Table N5.4-3.
 - e. Nondestructive testing (NDT) of welded joints
 - 1) Complete joint penetration welds
 - a) Ultrasonic testing shall be performed on 100 percent of complete joint penetration groove welds. For welds less than 5/16" thick, a magnetic particle test may be performed.
 - b) A reduction in rate of ultrasonic testing to 25 percent for an individual welder or welding operator is permitted when the conditions of Section N5.5e of ANSI/AISC 360 have been met.
 - c) If the rate of testing has been reduced, the rate of testing shall return to 100 percent if conditions of Section N5.5f of ANSI/AISC 360 have been met.
 - 2) Magnetic particle testing or penetrant testing shall be performed on all thermally cut surfaces of access holes when material $t > 2"$.
 - 3) Radiographic testing or ultrasonic testing shall be performed on welded joints subjected to fatigue as noted in the construction documents when required by ANSI/AISC 360, Appendix 3, Table A-3.1.

7. Structural steel bolting:
 - a. Inspection and testing shall be in accordance with AISC Specification for Structural Joints Using High-Strength Bolts.
 - b. Inspection Tasks Prior to Bolting
 - 1) Observe or perform tasks for each bolted connection in accordance with QA tasks listed in ANSI/AISC 360, Table N5.6-1.
 - 2) For connections with fully tensioned bolts, prior to visual and physical testing, tension testing using a calibration device (Skidmore-Wilhelm) must indicate tensions at least 5% in excess of the AISC minimum. Structural steel erector shall supply the tension calibration device. The inspector shall observe the pre-installation testing and calibration procedures.
 - 3) For connections with snug tight bolts, pre-installation verification testing is not applicable.
 - c. Inspection Tasks During Bolting
 - 1) Observe the QA tasks listed in ANSI/AISC 360, Table N5.6-2
 - 2) The inspector shall perform continuous inspection (including 100% of the connections) of bolt installation for tensioning when the calibrated wrench or the turn-of-nut method without match marking methods are used.
 - 3) The inspector shall perform periodic inspection (including a minimum of 10% of the connections) of bolt installation for tensioning when the turn-of-nut method with match marking techniques, the direct tension indicator, or the alternate design fastener (twist-off bolt) methods are used.
 - 4) For connections with Snug Tight Bolts, the inspector shall perform periodic inspection (including a minimum of 10% of the connections) of connections with snug tight bolts.
 - d. Inspection Tasks After Bolting
 - 1) Perform tasks for each bolted connection in accordance with QA tasks listed in ANSI/AISC 360, Table N5.6-3.

1.6 FABRICATOR'S QUALIFICATIONS

- A. Steel fabricator shall be approved by the Building Official to perform work on their premises without special inspection.
- B. Steel fabricator shall be a qualified fabricator who participates in the American Institute of Steel Construction (AISC) Certification program and is designated an AISC Certified Plant, Category BU at time of bid.

1.7 ERECTOR'S QUALIFICATION

- A. Erector shall participate in the AISC Certification program and shall be designated an AISC Certified Erector, Category CSE (Certified Steel Erector)
- B. Erector shall be experienced in erecting structural systems similar in complexity to this project as evidenced by 10 completed projects.
- C. Erector shall have a minimum of 5 years experience in the erection of structural steel.
- D. Field welders shall be qualified in accordance with AWS D1.1.

1.8 STORAGE

- A. Store materials off ground to permit easy access for inspection and identification. Store steel members and packaged items in a manner that provides protection against contact with deleterious materials.

PART 2 - PRODUCTS

2.1 ANCHOR RODS

- A. Anchor rods shall be threaded rods conforming to ASTM F1554 Gr. 36 unless noted otherwise on the drawings. The anchor rods shall be threaded at both ends.
- B. Provide a heavy hexagonal nut threaded and tack welded to the bottom of each rod unless noted otherwise on the structural documents. The nut shall conform to ASTM A563 Grade A or DH.
- C. Provide heavy hexagonal nut and plain steel washer at the top of each rod. The nut shall conform to ASTM A563 Grade A or DH and washer shall conform to ASTM F844. Leveling nuts and washers shall be provided as deemed necessary by the contractor for erection.
- D. Provide square plate washers conforming to A36 with standard holes in lieu of top steel washers on base plates with oversize holes. Oversized holes are defined as any hole that is larger than a standard hole as defined in Chapter J of the ANSI/AISC 360. Recommended maximum base plate holes as given in the AISC Manual of Steel Construction are considered oversized holes and should not be exceeded.

2.2 ROLLED STEEL SHAPES, PLATES, AND BARS

- A. Rolled steel W and WT shapes shall conform to ASTM A992, 50 ksi minimum yield strength, unless noted otherwise on the contract drawings. ASTM A572, Grade 50 may be substituted for ASTM A992.
- B. Rolled steel M, S, C, MC, and L shapes shall conform to ASTM A36, 36 ksi minimum yield strength, unless noted otherwise on the contract drawings.
- C. Plates and Bars shall conform to ASTM A36, 36 ksi minimum yield strength, unless noted otherwise on the contract drawings.

2.3 SQUARE/RECTANGULAR HOLLOW STRUCTURAL STEEL SECTIONS

- A. Square/rectangular hollow structural steel sections shall conform to ASTM A500, Grade C, 50 ksi minimum yield strength or ASTM A1085.

2.4 ROUND HOLLOW STRUCTURAL STEEL SECTIONS

- A. Round hollow structural steel sections shall conform to ASTM A500, Grade C, 46 ksi minimum yield strength or ASTM A1085.

2.5 ROUND HOLLOW STEEL PIPE

- A. Round hollow steel pipe shall conform to ASTM A53, Grade B, 35 ksi minimum yield strength.

2.6 NON-HIGH-STRENGTH FASTENERS

- A. Non-high-strength bolts shall conform to ASTM A307, Grade A, 60 ksi minimum, where noted on the Structural Drawings.
- B. Hardened steel washers shall conform to ASTM F436.

2.7 HIGH-STRENGTH FASTENERS

- A. High-strength bolts shall conform to ASTM F3125 as noted on the Structural Drawings.

- B. Provide 3/4-inch minimum diameter bolts, unless noted otherwise.
- C. Hardened steel washers shall conform to ASTM F436.
- D. Spline-type tension control bolts, plain hardened washers and suitable nuts are an acceptable alternate design bolt assembly.
- E. Do not use load indicating washers.

2.8 HEADED STUDS

- A. Headed steel studs shall conform to the requirements of AWS D1.1 and shall be Type B made from ASTM A108 material.
- B. Provide 3/4-inch diameter headed steel studs, unless noted otherwise.
- C. Provide heat-resistant ceramic arc shields with studs.

2.9 POST-INSTALLED ANCHORS

- A. Post-installed anchors installed into structural concrete shall be ICC approved for use in cracked concrete.
- B. Post-installed anchors installed into concrete block shall be approved for use in the block type (grout filled or hollow) under consideration.

2.10 WELD ELECTRODES

- A. E-70 series low hydrogen electrodes shall conform to AWS A5.1, A5.5, A5.17, or A5.20.
- B. Properly store electrodes to maintain flux quality.

2.11 PRIMER

- A. Oxide primer shall conform to AISC Specifications, Code of Standard Practice, and SSPC Steel Structure Painting Manual, unless indicated otherwise.
- B. Paint primer shall be free of lead and chromate and shall comply with State and Federal volatile organic compound (VOC) requirements.
- C. Paint primer shall be compatible with finish coating.

2.12 GALVANIZING

- A. Galvanized steel coating shall conform to ASTM A123.
- B. Galvanize bolts, nuts, and washers in accordance with ASTM F2329 when used to connect steel members that are specified to be galvanized.
- C. Post-Installed anchors specified to be galvanized shall be mechanically galvanized in accordance with ASTM B695, Class 65, Type I.

PART 3 - EXECUTION

3.1 GENERAL

- A. Fabricate and erect structural steel in accordance with AISC Specifications and Code of Standard Practice.
- B. The Erector shall provide all required temporary erection bracing and shoring necessary to safely erect the structural frame to withstand construction loading as provided in ASCE 37.
- C. Notify Architect/Structural Engineer and Structural Testing/Inspection Agency at least 48 hours prior to structural steel fabrication and erection.

3.2 ANCHOR BOLT (ROD) SETTING

- A. Provide templates for setting anchor bolts (rods). Position anchor bolts (rods) by using templates with two nuts to secure in place prior to placement of concrete.
- B. Do not erect steel where anchor bolt (rod) nuts will not have full threads.

3.3 CONNECTIONS

- A. Provide a minimum of two fasteners at each bolted connection.
- B. Ensure fasteners are lubricated prior to installation.
- C. Provide high-strength bolted connections in accordance with AISC Specification for Structural Joints Using High-Strength Bolts.
- D. Provide connections for expansion and contraction where steel beams connect to concrete walls or concrete columns and at expansion joints. Secure nuts on bolts against loosening. (Dent threads with a chisel.)

3.4 FASTENER INSTALLATION

- A. Install high-strength bolts according to AISC Specification for Structural Joints Using High-Strength Bolts for type of bolt and type of joint specified.
- B. High-strength bolts installed shall have a hardened washer under the element turned in tightening.

3.5 HEADED STUDS

- A. Headed studs shall be welded in accordance with AWS D1.1.
- B. Remove shields after welding studs.

3.6 WELDING

- A. Comply with AWS Structural Welding Code. Use prequalified weld procedures.
- B. Provide end returns where fillet welds terminate at end or sides. Returns shall be continuous for a distance of not less than two times the nominal size of the weld.

- C. Complete penetration joints shall be backgouged to sound metal before the second side is welded or have 1/4-inch root opening with 3/16 x 1-inch backing bar. Access holes are required. Filling access holes is not required.
- D. Remove all slag and weld splatter from deposited weld metal.

3.7 SPLICING

- A. Splice members only where indicated unless authorized in writing by Structural Engineer.
- B. Provide shim plates at bottom flange splice at continuous beam splices with different depths.

3.8 CUTTING

- A. Do not use flame cutting to correct errors unless authorized in writing.
- B. Re-entrant corners shall have a minimum radius of one inch and be free of notches. Notches and gouges resulting from flame cutting shall be finished to a smooth appearance.

3.9 MILL SCALE

- A. Remove loose mill scale.

3.10 BOLT HOLES

- A. Cut, drill, or punch holes perpendicular to metal surfaces. Do not enlarge holes by burning. Drill or punch holes in bearing plates. Remove burrs.

3.11 PRIMING STEEL

- A. Prime steel that is not encased in concrete, plaster, or sprayed fireproofing. Do not shop prime in areas to be field welded, contact surfaces of slip critical connections, or areas to receive special finishes.
- B. Field prime, as required, steel that has been welded or that is not primed after connections have been tightened.
- C. Verify primer requirements with Architect for buildings without fireproofing.

3.12 GALVANIZING

- A. Galvanize environmentally exposed steel; for example, mechanical equipment supports.
- B. Touch-up welds and abrasions in galvanized members in accordance with ASTM A780.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

**SECTION 05 3000
STEEL DECKING**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section includes steel decking as indicated on Drawings, specified herein, and needed for a complete and proper installation.

1.2 RELATED SECTIONS

- A. Section 01 3324 - Structural Submittals.
- B. Section 01 4524 - Structural Testing/Inspection Agency Services.
- C. Section 05 1200 - Structural Steel.

1.3 REFERENCES

- A. AISI-S100, North American Specification for the Design of Cold-Formed Steel Structural Members
- B. ANSI/AWS D1.1 - Structural Welding Code / Steel.
- C. ANSI/AWS D1.3 - Structural Welding Code / Sheet Steel.
- D. ANSI/AWS A5.5 - Specifications for Carbon Steel Electrodes for Shielded Metal Arc Welding.
- E. ANSI/SDI RD - Design Standard for Steel Roof Deck
- F. ANSI/SDI NC - Design Standard for Non-Composite Steel Floor Deck
- G. ANSI/ASSE A10.3 - Safety Requirements for Powder Actuated Systems.
- H. ANSI/SDI QA/QC - Quality Control and Quality Assurance for Installation of Steel Deck
- I. ASTM A653 / A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- J. ASTM A924 / A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- K. ASTM A1008 / A1008M - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Carbon, Structural, High-Strength Low Alloy and High Strength Low Alloy with Improved Formability.
- L. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- M. FS TT-P-664 Federal Specification for Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant.
- N. FS QQ-S-775D Federal Specification for Steel Sheets, Carbon, Zinc Coated.
- O. SDI Steel Deck Institute Manual of Construction with Steel Deck (MOC3)

- P. SDI Diaphragm Design Manual, 4th Edition.
- Q. SDI Roof Deck Design Manual (RDDM)
- R. SDI Code of Standard Practice (COSP)

1.4 SUBMITTALS

- A. Notify the Structural Engineer prior to detailing shop drawings.
- B. Submit product data for each type of deck, accessory, and product indicated.
- C. Submit detailed shop drawings showing layout and types of deck panels, weld or mechanical fastener types and sizes, weld or mechanical fastener patterns, conditions requiring closure panels, supplementary framing, sump pans, cant strips, cut openings, special jointing or other accessories. Where variances in substrate thickness require the use of multiple mechanical fastener types, the layout locations of each fastener type must be clearly indicated in plan on the shop drawings. Include calculations and required information if not completely covered by load tables and products data.
- D. Mechanical fasteners shall be permitted to fasten deck to support framing where specifically indicated on the Drawings or in lieu of welding where approved by the Structural Engineer. Where mechanical fasteners are proposed in lieu of welds, include calculations in accordance with SDI Diaphragm Design Manual, 4th Ed., indicating equivalent diaphragm strength to specified attachment pattern.
- E. Upon request, submit mill certification that the steel supplied meets the required specifications.
- F. Upon request, submit written welding procedures and certificates for welding personnel.
- G. Submit manufacturer's specifications, load tables and installation instructions for each type of decking and accessories. Include manufacturer's certifications to show compliance with supplementary framing, sump pans, cant strips, curb openings, special jointing and other accessories.
- H. Submit manufacturer's test reports, for record only, from a qualified testing agency indicating that each of the following complies with requirements, based on comprehensive testing of current products:
 - 1. Mechanical fasteners
 - 2. Acoustical roof deck

1.5 QUALITY ASSURANCE

- A. Steel deck installer shall have completed a minimum of five projects with similar steel deck material, design, and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.
- B. Welding procedures and personnel shall be qualified in accordance with ASW D1.1 and AWS D1.3.
- C. Operators of Powder-actuated tools shall be certified in accordance with ANSI/ASSE A10.3.
- D. Structural Testing/Inspection Agency shall perform the following quality related items:
 - 1. Verify placement of deck for alignment and proper lap.
 - 2. Verify deck gage.
 - 3. The inspector shall verify welding procedures and welder qualifications prior to the start of work.
 - 4. Inspection of puddle welds and mechanical fasteners shall be considered to comply with the periodic inspection of floor and deck welds required by the schedule of special inspections section 1704.3e.

- a. Welds: Visually inspect 100% of welded connections for proper size, quality, and pattern. Measure all weld sizes where adequacy is inconclusive based on a visual inspection. All welds with inadequate size or other deficiencies must be repaired.
 - b. Mechanical fasteners: Visually inspect 100% of connections for proper type, embedment, and spacing. Examine washer condition and ensure deck is clamped to the supporting steel framing. Measure all fastener embedments where adequacy is inconclusive based on a visual inspection. All deficient mechanical connectors must be corrected by replacing the deficient connector.
5. All personnel installing steel deck mechanical fasteners shall be trained on-site by the connector manufacturer in proper installation procedures.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide steel deck sheets of three spans minimum wherever possible.
- B. Provide steel deck that has been approved under the applicable Underwriter's Laboratory (UL) and / or Factory Mutual (FM) ratings applicable to the project.
- C. Structural properties of steel deck shall be calculated in accordance to AISI-S100, North American Specification for the Design of Cold-Formed Steel Structural Members.
- D. Provide steel deck type as indicated in the Contract Documents.
- E. Steel deck, closures, and accessory gages shall be determined by the steel deck supplier's design engineer who is licensed in the project state. The design of the steel deck shall be the sole responsibility of the deck supplier and its design engineer. The deck shall be designed to resist the design loads provided in the Contract Documents. Deck gage shall not be less than the minimum gage indicated in the contract documents.

2.2 MATERIAL AND FINISH

- A. Galvanized Steel Sheet
 1. Steel Sheet shall conform to ASTM A653 and shall have a minimum yield strength of 33,000 pounds per square inch.
 2. Galvanizing shall conform to ASTM A653 with a minimum coating of G90 on both sides. The coating shall conform to Federal Specification QQ-S-775-d, Type I, Class E.

2.3 TOLERANCE

- A. Uncoated thickness shall not be less than thickness as listed below:

Gage No.	Design Thickness (inches)	Minimum Thickness (inches)
18	0.0474	0.045
20	0.0358	0.034
22	0.0295	0.028

- B. Panel length shall be within plus or minus 1/2-inch of specified length.
- C. Panel cover width shall be no greater than minus 3/8-inch, plus 3/4-inch.
- D. Panel camber and / or sweep shall be no greater than 1/4-inch in 10 foot length.
- E. Panel end out of square shall not be greater than 1/8-inch per foot of panel width.

2.4 DECK ACCESSORIES

- A. Provide accessories, clips, and other items as required for deck installation. Sheet steel for accessories shall be of the same material and finish as steel deck.
- B. Provide Roof Sump pans when required by Architect. Fabricate sump pan from a single piece of 14 gage galvanized sheet steel with level bottoms and sloping sides to direct water flow to drain, unless otherwise shown. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3 inches wide. Recess pans not less than 1-1/2 inches below roof deck surface, unless otherwise shown or required by deck configuration. Holes for drains will be cut in the field.
- C. Provide Cant Strips when required by Architect. Fabricate cant strips from 20 gage sheet steel. Bend to form a 45 degree cant not less than 5 inches wide with top and bottom flanges not less than 2 inches wide, unless otherwise shown.
- D. At all concrete filled deck provide closures for columns, girders, where panels change direction, and end closures for panels not closed by bent plates or other means. Closures shall be fabricated of steel sheet of the same material and finish as the concrete filled deck.
- E. Flexible Closure Strips shall be Vulcanized, closed-cell, synthetic rubber.
- F. Galvanizing Repair Paint shall meet ASTM A780 with dry film containing a minimum of 94 percent zinc dust by weight.
- G. Repair Paint shall be lead- and chromate-free rust-inhibitive primer complying with performance requirements of FS TT-P-664.

2.5 DECK ATTACHMENT

- A. Welds
 - 1. Use E-60 series electrodes conforming to AWS A5.1.
 - 2. Welding washers shall be fabricated from sheet steel shaped to fit the deck rib, shall be a minimum thickness of 0.0598-inches, and shall have a factory punched nominal 3/8-inch diameter hole.
- B. Mechanical Fasteners
 - 1. Approved Manufacturers and Types: Mechanical fasteners shall be one of the following types or approved equal. Approved equal shall be determined by the Structural Engineer based on submittal of appropriate manufacturer's diaphragm shear and tension test data and design recommendations. Products shall be chosen based on the actual thickness of substrate within the limits indicated below.
 - a. Hilti:
 - 1) X-HSN24 (substrate thickness: 0.125 in. to 0.375 in.)
 - 2) X-ENP-19 L15 (substrate thickness: 0.25 in. or thicker)
 - b. Pneutek:
 - 1) SDK63-series (substrate thickness: 0.155 in. to 0.25 in.)
 - 2) K64-series (substrate thickness: 0.187 in. to 0.312 in.)
 - 3) K66-series (substrate thickness: 0.28 in. or thicker)

- c. Simpson:
 - 1) Strong-Drive XL (substrate thickness: 0.125 in. to 0.375 in.)
 - 2) Self-Drilling X Screws (substrate thickness: 0.125 in. to 0.375 in.)
- 2. Where fasteners are exposed to the elements in their final condition, an AISI 304 stainless steel sealing cap with bonded neoprene washer shall be installed over each fastener. Alternately, fasteners with coatings that have met the requirements of ASTM G85 Annex E for 140 cycles are permitted.
- C. Sidelap Fasteners:
 - 1. Seam Welds: 1-1/2 in. long fillet welds in accordance with AWS D1.3 procedures.
 - 2. Mechanical Sidelap Connectors: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel, No. 10 minimum diameter screws.

2.6 ROOF DECK

- A. Roof Deck shall comply with ANSI/SDI RD Standard For Steel Roof Deck except as modified by the contract documents.
- B. Provide vented deck if required by lightweight insulating concrete system. Percent venting shall be determined by the supplier based on project conditions and insulating concrete system to be used.
- C. Deck shall be designed in accordance with ANSI/SDI RD Standard For Steel Roof Deck Section 2.4.A.1 through Section 2.4.A.7.
 - 1. Deck shall be designed for a total service load of 50 pounds per square foot and a live service load of 20 pounds a square foot
 - 2. Deck shall be designed for a net wind service uplift load of 50 pounds per square foot.

PART 3 - EXECUTION

3.1 GENERAL

- A. Load conditions shall not exceed SDI sequential loading formulas.
- B. Installer must examine the areas and conditions under which steel decking is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
- C. Deck panels and accessories shall be installed according to the SDI Manual of Construction with Steel Deck, placement plans, and requirements of this Section.
- D. Deck panels shall be placed on structural supports and adjusted to final position with ends aligned and attached securely to the supports immediately after final positioning.
- E. Place deck in straight alignment for the entire length of the run of the sheets.
- F. Do not weld deck in place until all bolted and welded connections for the structural frame are complete. A minimum of one floor over the area to be decked is to be bolted and welded prior to welding deck in place.
- G. Deck ends over supports shall be installed with a minimum end bearing of 1-1/2-inches.
- H. Deck shall be protected by planking or other approved means to avoid overloading and / or damage from construction loading.

- I. Accessories (including closures) shall be anchored to supporting members by arc spot welds or self drilling screws at 12-inch max spacing.
- J. Deck bundles shall be located to prevent overloading of supporting members and deck panels shall only be placed on concrete that has reached a minimum of 75% of its specified design strength.
- K. Install roof sump pans over openings provided in roof decking and weld flanges to top of deck. Space welds not more than 12-inches apart with at least 1 weld at each corner.

3.2 CONCENTRATED LOADS

- A. Concentrated loads hanging from the deck are limited to the locations, frequency, and magnitudes shown on the structural drawings. If no limitations are given consult the Architect/Structural Engineer.

3.3 CUTTING

- A. Cut holes in deck indicated by the Drawings. Other holes required shall be supplied by those requiring them. Obtain written authorization for additional holes and cutting not indicated on erection drawings.
- B. Cut holes in deck after concrete is in place, has reached 75% of its design strength, and after a minimum of 7 days.

3.4 WELDING

- A. All welding of deck shall be in accordance with ANSI/AWS D1.3, Structural Welding Code – Sheet Steel. Each welder shall demonstrate an ability to produce satisfactory welds using a procedure such as shown in the SDI Manual of Construction with Steel Deck and as described in ANSI/AWS D1.3.
- B. Provide weld washers for deck thinner than 22 gage.
- C. Weld metal shall penetrate all layers of deck material at end laps and shall have good fusion to the supporting members.
- D. Where two panels butt, fasten each deck unit with separate welds.

3.5 MECHANICAL FASTENING

- A. Gauge powder-actuated tool systems to the base material steel type, steel deck type and thickness prior to final installation. Confirm appropriate power regulation and powder-actuated cartridge type prior to final installation.
- B. Verify axis of fastener is within +/- 10 degrees of perpendicular to the deck prior to driving.
- C. Where two panels butt, fasten each deck unit with separate fasteners.

3.6 SHORING

- A. Contractor may elect to shore deck to reduce deflection and overrun of concrete.
- B. Shoring shall be in place before deck erection begins.
- C. Shoring shall be left in place until the slab attains 75% of the specified design strength and a minimum of 7 days.

- D. Do not shore structural beams or girders unless indicated on Drawings or authorized in writing by Structural Engineer.

3.7 ROOF DECK

- A. Deck ends shall be lapped a minimum of 2-inches at supports.

3.8 NONCONFORMING WORK AND REPAIRS

- A. Work not conforming with the contract documents shall be repaired or replaced at the Contractor's expense.
- B. Additional testing and inspection required to determine compliance of corrected work shall be at the Contractor's expense.
- C. Repair damaged galvanized coatings on both surfaces of the deck with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.
- D. Repair damaged paint coatings on painted sides of the deck with repair paint.
1. Wire brush and clean rust spots, welds, and abraded areas.
 2. Repair paint shall be of same color as shop-primed deck where exposed to view.
- E. Replace or supplement under-driven and over driven mechanical fasteners with adjacent, properly installed fasteners.

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END OF SECTION

**SECTION 05 4000
COLD-FORMED METAL FRAMING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formed steel stud exterior wall framing.

1.2 RELATED REQUIREMENTS

- A. Section 05 3100 - Steel Decking.
- B. Section 06 1643 - Gypsum Sheathing: Gypsum-based sheathing.

1.3 REFERENCE STANDARDS

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.5 SUBMITTALS

- A. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.
- B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- C. Shop Drawings: Indicate component details, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
 - 1. Indicate stud layout.
 - 2. Describe method for securing studs to tracks and for bolted framing connections.
 - 3. Design data:
 - a. Shop drawings signed and sealed by a professional structural engineer.
 - 4. Calculations for loadings and stresses of specially fabricated framing, signed and sealed by a professional structural engineer.
- D. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .
- E. Designer's Qualification Statement.
- F. Manufacturer's Qualification Statement.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Metal Framing:
 - 1. CEMCO: www.cemcosteel.com/#sle.
 - 2. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 3. Marino: www.marinoware.com/#sle.
 - 4. SCAFCO Corporation: www.scafco.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Framing Connectors and Accessories:
 - 1. Same manufacturer as metal framing.

2.2 FRAMING SYSTEM

- A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
- B. Design Requirements: Provide completed framing system having the following characteristics:
 - 1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100-12.
 - 2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
 - 3. Design Loads: As indicated on the drawings.
 - 4. Live load deflection meeting the following, unless otherwise indicated:
 - a. Exterior Walls: Maximum horizontal deflection under wind load of 1/360 of span.
 - 5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
 - 6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.3 FRAMING MATERIALS

- A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
 - 1. Gage and Depth: As required to meet specified performance levels.
 - 2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.
- B. Framing Connectors: Factory-made, formed steel sheet.
 - 1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gage, 0.1345 inch, and factory punched holes and slots.
 - 2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
 - 3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing.
 - a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
 - 4. Fixed Connections: Provide non-movement connections for tie-down to foundation, roof-to-wall tie-down, and stiffeners.

2.4 FASTENERS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

- B. Anchorage Devices: Powder actuated.
- C. Welding: Comply with AWS D1.1/D1.1M.

2.5 ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
- B. Plates, Gussets, Clips: Formed Sheet Steel, thickness determined for conditions encountered; finish to match framing components.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify field measurements and adjust installation as required.

3.2 INSTALLATION OF STUDS

- A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.
- B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center.
- C. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- D. Attach cross studs to studs for attachment of fixtures anchored to walls.
- E. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- F. Touch-up field welds and damaged galvanized surfaces with primer.
- G. Periodic special inspection shall be provided by the special inspector, coordinated by the Contractor, during the construction of load and non-load bearing walls per the requirements specified in Division 1 Specification "Structural Tests and Inspections".

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END OF SECTION

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Shop fabricated steel items.

1.2 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 05 1200 - Structural Steel Framing: Structural steel column anchor bolts.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
- F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- I. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2019, with Editorial Revision (2020).
- J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.
- K. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.
- L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 1999 (Ed. 2004).
- M. SSPC-SP 2 - Hand Tool Cleaning 2018.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
 - a. Include the following, as applicable:
 - 1) Design criteria.
 - 2) Engineering analysis depicting stresses and deflections.
 - 3) Member sizes and gages.
 - 4) Details of connections.
 - 5) Support reactions.
 - 6) Bracing requirements.
 - B. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
 - C. Designer's Qualification Statement.
 - D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
- F. Slotted Channel Fittings: ASTM A1011/A1011M.
- G. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- H. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- I. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- J. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- K. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by intermittent welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FABRICATED ITEMS

- A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
- B. Door Frames for Overhead Door Openings: Channel sections; prime paint finish.
- C. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.

2.4 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.5 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.

- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

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**SECTION 05 5213
PIPE AND TUBE RAILINGS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted handrails.
- B. Stair railings and guardrails.
- C. Free-standing railings at steps.

1.2 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.

1.3 REFERENCE STANDARDS

- A. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures 2006.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- E. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.
- G. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel 2018.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- B. Designer's Qualification Statement.
- C. Fabricator's Qualification Statement.

1.5 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.
- C. Fabricator Qualifications:
 - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

2. A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
3. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS

2.1 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
 1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
 2. Intermediate Rails: 1-1/2 inches diameter, round.
 3. Posts: 1-1/2 inches diameter, round.
 4. Balusters: 1/2 inch square solid bar.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.

2.2 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, black finish.
- C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- D. Exposed Fasteners: No exposed bolts or screws.
- E. Straight Splice Connectors: Steel welding collars.
- F. Galvanizing: In accordance with requirements of ASTM A123/A123M.
 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.

2.3 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:

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

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.3 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- B. Install railings in compliance with ADA Standards for accessible design at applicable locations.
- C. Anchor railings securely to structure.
- D. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.

3.4 TOLERANCES

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

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**SECTION 06 1053
MISCELLANEOUS ROUGH CARPENTRY**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood blocking and nailers.
 - 2. Wood furring.
 - 3. Plywood backing panels.

1.2 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

1.3 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials complying with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials complying with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber, both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
 - 4. For products receiving a waterborne treatment include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
 - 1. Preservative-treated wood.
 - 2. Fire-retardant-treated wood.
 - 3. Power-driven fasteners.
 - 4. Post-installed anchors.
 - 5. Metal framing anchors.

1.5 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.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheets suitably anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat all miscellaneous carpentry unless otherwise indicated.
 - 1. Concealed blocking.
 - 2. Roof framing and blocking.
 - 3. Plywood backing panels.

2.4 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 as appropriate for the substrate.
 - 1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- D. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- E. Comply with AWWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- F. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- G. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILER

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

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**SECTION 06 1643
GYPSUM SHEATHING**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-mat gypsum wall sheathing.
 - 2. Sealing joints and penetrations in and associated with gypsum sheathing.

1.2 DEFINITIONS

- A. Gypsum Board Construction Terminology Standard: Refer to ASTM C 11 for definitions of terms for gypsum sheathing board construction not defined in this Section or in other referenced standards.

1.3 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: Not required.

1.4 INFORMATIONAL SUBMITTALS

- A. Submit letter stating that products will be provided per Owner's Bulk Purchasing List.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, or other causes. Stack sheathing flat on leveled supports off the ground, under cover, and fully protected from weather.

1.6 COORDINATION

- A. Glass-Mat Gypsum Sheathing Board:
 - 1. Do not leave exposed to weather for more than 180 days unless otherwise approved in writing by manufacturer.

PART 2 -PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/C 1177M with acrylic coating on exterior side.
- B. Manufacturers
 - 1. Products
 - a. DSottile@LWSupply.com
 - 2. Type and Thickness: Regular, 5/8 inch (15.9 mm) thick.
 - 3. Permeance: Not less than 26 perms per ASTM E 96.
 - 4. Size: 48 inches by 120 inches.
 - 5. Mold Growth: 10, per ASTM D 3273.

2.2 FASTENERS

- A. Fasteners: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing board 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, attach sheathing with drill screws complying with ASTM C 954.

2.3 SHEATHING JOINT AND PENETRATION SEALANT

- A. Sheathing Sealant: Refer to Section 07 2726 "Fluid-Applied Membrane Air Barrier". Sealant must be approved by Air-Barrier manufacturer.

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. 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.
- C. Comply with GA-253 and manufacturer recommendations.
- D. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
1. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 2. Install boards with a 1/4-inch gap where they abut concrete, masonry, or similar materials that might retain moisture, to prevent wicking.
- E. Coordinate 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 exterior wall assembly.
- F. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.
- G. Horizontal Installation: Install sheathing with ends of boards over centers of stud flanges, and stagger end joints of adjacent boards not less than one stud spacing. Screw-attach boards at perimeter and within field of board to each steel stud.
1. Space fasteners approximately 8 inches on center and set back minimum 3/8 inch from edges and ends of boards.
 - a. Decrease spacing between fasteners where required to comply with design wind loads, and as indicated in shop drawings submitted under Division 05 Section "Cold-Formed Metal Framing."

3.2 SHEATHING JOINT-AND-PENETRATION TREATMENT

- A. Seal sheathing joints according to "Air-Barrier" manufacturer's written recommendations.
1. Apply sealant on joints and fasteners and trowel flat. Apply sufficient quantity of sealant to completely cover joints and fasteners after troweling, unless directed otherwise by "Air-Barrier" manufacturer recommendations. Seal other penetrations and openings.
 - a. Utilize primers and tapes as recommended by sealant manufacturer at corners and joints at adjacent substrates.
- B. Taping of joints will not be accepted as an alternative or substitute for application of joint sealant.

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**SECTION 06 4020
CASEWORK HARDWARE AND ACCESSORIES**

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes finish hardware and accessories for cabinetry and countertops.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 06 4116 "Plastic-Laminate-Faced Architectural Cabinets".
 - 2. Section 12 3216 "Manufactured Plastic-Laminate-Faced Casework".
 - 3. Section 12 3623.13 "Plastic-Laminate-Clad Countertops".
 - 4. Section 12 3661 "Simulated Stone Countertops".

1.2 REFERENCES

- A. Standards of the following as referenced:
 - 1. American National Standards Institute (ANSI)
 - 2. Builders Hardware Manufacturers Association (BHMA)
 - 3. Business and Institutional Furniture Manufacturer's Association (BIFMA)
- B. Regulatory standards of the following as referenced:
 - 1. Department of Justice, Office of the Attorney General, Americans with Disabilities Act, Public Law 101-336 (ADA).

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including manufacturers' technical product data for each item of hardware and accessory, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements. Provide catalog information for the specified items and for those submitted.
 - 1. Submittal Coordination: Submit concurrent with, or combined with, casework/countertop submittals to allow a coordinated review.
 - 2. Submittal Sequence: Submit at earliest possible date particularly where acceptance of hardware must precede fabrication of casework that is critical in the Project construction schedule.
- C. Review shop drawings of other work to confirm that adequate provisions are made for locating and installing casework hardware and accessories to comply with indicated requirements.
- D. Contract closeout submittals:
 - 1. Operation and maintenance data: Complete information for installed casework hardware and accessories.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware and accessory from a single manufacturer.
- B. Supplier Qualifications: A distributor that has a record of successful in-service performance for supplying casework hardware and accessories similar in quantity, type, and quality to that indicated for this Project.

1.5 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of casework hardware and accessories.

PART 2 PRODUCTS

2.1 CASEWORK HARDWARE AND ACCESSORIES

- A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware.
 - 1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.
- B. Butt Hinges: Provide heavy duty 5-knuckle 270-degree pivot reveal overlay style. Hinges shall have interlaying leaves 270 degree swing constructed of 090-inch thick steel. Hinges shall be (Grade 1) with hospital ground tips and non-removable pin. 5-knuckle hinges shall be available in minimum five (5) standard finishes. Five-knuckle hinges complying with BHMA A156.9, Grade 1. Provide two hinges for doors less than 48 inches high, and provide three hinges for doors more than 48 inches high.
- C. Frameless Concealed Hinges (European Type): Provide BHMA A156.9, Type B01602, 170 degrees of opening, self-closing. Provide 2 hinges for doors less than 36-inches, 3 hinges for door from 36 to 72-inches, 4 hinges for doors over 72-inches.
 - 1. Provide in rooms that are within the Assembly Occupancy.
- D. Pulls: ADA compliant, solid aluminum wire pulls, 4 inches long minimum, 5/16 inch in diameter, fastened from back with two screws. For sliding doors, provide recessed chrome-plated flush pulls. Provide two pulls for drawers more than 24 inches wide.
- E. Door Catches: BHMA A156.9, B04013 [Zinc-plated] [Powder-coated], [nylon-roller spring catch] [or] [dual, self-aligning, permanent magnet catch]. Provide two catches on doors more than 48 inches high.
- F. Drawer Slides: BHMA A156.9, Type B05091.
 - 1. Standard Duty: Extension slides shall be bottom and side mount epoxy steel slides. Lateral stability achieved through a formed captive slide profile. Slides shall glide on nylon rollers and carry a 100# dynamic load rating. Slides feature both in and out drawer stop with 3-inch self-close and adjustable cam side alignment. Drawer slides shall meet or exceed Grade 1 requirements per ANSI A156.9/BHMA with full extension slides on file and paper storage. For drawers more than 6 inches high or more than 24 inches wide, slides shall meet or exceed Grade 1HD-100.
 - 2. File Drawer Slides: Full extension ball bearing slides. Slides shall be side mounted with profile to not reduce interior drawer space normally provided. Ball bearing slides to be tested under the Business and Institutional Furniture Manufacturer's Association (BIFMA) X5.5 Section 7. Slides shall pass both 50,000 and 100,000 cycle test with a 120# load rating.
- G. Door and Drawer Silencers: BHMA A156.16, L03011.
- H. Adjustable Shelf Rests: Single-pin satin finish metal shelf rests complying with BHMA A156.9, Type B04013.
- I. Wire Manager: Doug Mockett and Company Large J-Shape Wire Manager with Flange No. WM22A. Install per manufacturer's recommendations for double-sided tape installation.
- J. Grommets for Cable Passage through Countertops: Doug Mockett and Company as follows:
 - 1. EDP3 Flip-Top Series 2-1/2-inch Grommet.
 - 2. Color: As selected from Manufacturer's full range.
- K. Workstation and Countertop Support Brackets: A&M Hardware, Inc., Standard Bracket, 1/8-inch Steel, ADA compliant.
 - 1. Finish: Pre-primed finish.
 - 2. Color: As selected from manufacturer's full range.
 - 3. Size: As required to support 50 lb/sf minimum uniform load and 200 lbf minimum concentrated load with maximum 1/4-inch deflection.

2.2 HARDWARE FINISHES

- A. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Satin Stainless Steel: BHMA 630.
- B. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware and accessories.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install each item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware and accessories onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- B. Set units level, plumb, uniformly and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation. Set hinges snug and flat in mortises unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- C. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and accessories to ensure proper operation or function of every unit. Doors and drawers shall operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
 - 1. Where operating items are installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all operable items in such space or area. Clean operating items as necessary to restore proper function and finish.
- B. Clean adjacent surfaces soiled by field installed hardware and accessories.
- C. Hardware and Accessory Supplier's Field Service:
 - 1. Inspect items for correct installation and adjustment after complete installation.
 - 2. Instruct Owner's personnel in the proper adjustment and maintenance of hardware, accessories and finishes.
 - 3. File written report of this inspection to Architect.

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END OF SECTION

**SECTION 06 6450
SOLID SURFACING FABRICATIONS**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes: Following items fabricated from solid surfacing materials.
 - 1. Window stools.
- B. Related Requirements:
 - 1. Section 07 9200: Elastomeric sealants for joints between solid surfacing fabrications and other construction.
 - 2. Section 12 3661: Solid surfacing material countertops.

1.2 DEFINITIONS

- A. Solid Surfacing Material: Manufactured nonporous, homogeneous decorative material of resinous composition that has consistent color and pattern throughout the thickness of the material.

1.3 PREINSTALLATION MEETINGS

- A. Conduct preinstallation meeting per requirements of Section 01 3100.

1.4 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: Each required type of solid surfacing material.
- C. Shop Drawings: Each type of fabrication. Use same unit designations used in Contract Documents.
 - 1. Show edge details in large scale.
 - 2. Show relationship with construction specified in other sections, including requirements for concealed supports.
 - 3. Show anchorage and field assembly joints.
- D. Material Samples for Verification: Each required color and pattern.
 - 1. Minimum 8 by 10 inches.
 - 2. Include one seam in each sample. Approved sample shall be comparison standard for assembly seams made at site.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Include cleaning and repair recommendations.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who regularly custom fabricate items similar to those required for this project and whose products have successful in-service performance.
- B. Manufacturer Certification: Employ entity that is certified by manufacturer of solid surfacing materials for fabrication and installation of custom fabrications of types required for Project.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of Section 01 6000.
- B. Deliver fabrications only after building is enclosed and permanent HVAC system is functioning.
- C. Store fabrications inside building and protect from staining, soiling, abrasion, cracking, and other damage.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Measure in-place and existing construction as needed for fabrication and execution of the Work. No changes to Contract Sum or Contract Time will be allowed for differences between dimensions on Drawings and field measurements.

1.9 WARRANTY

- A. Manufacturer Warranty: Warrant custom fabrications and installation against defects. Remedy shall include material and labor to new replacement work for defective Work.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 -PRODUCTS

2.1 SOLID SURFACING MATERIALS

- A. Specific proprietary products, including colors and patterns, are specified on Drawings.

2.2 ACCESSORIES

- A. Seaming Materials: Product that will provide inconspicuous seams and that does not affect color of joined panels, and is recommended by manufacturer of solid surfacing material.
- B. Attachment Adhesive: Product recommended by manufacturer of solid surfacing material for Project applications.
- C. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 FABRICATION

- A. Appearance:
 - 1. Provide fabrications with uniform color, pattern, and surface finish, and that are free of stains and discoloration.
 - 2. Provide fabrications free of adhesives and other foreign substances on exposed surfaces, including edges.
- B. Fabricate solid surfacing items in shop to extent possible. Fabricate items in sizes to for trimming on site to fit in-place construction.
- C. Seams:
 - 1. Form joints and seams in straight lines.
 - 2. Form joints and seams to be flush and accurately aligned.
- D. Window Stools:
 - 1. For openings less than 10 ft wide, fabricate stools in single pieces.
 - 2. For wider openings, fabricate stools with 1/8-inch joints for sealant located at every other vertical mullion.
 - 3. Edges: Eased top and bottom edges to 1/8-inch radius.

2.4 SOURCE QUALITY CONTROL

- A. Require fabricator to inspect all fabrications before shipment to site.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Verify that substrates are plumb, level, and in plane, as needed for installation.

3.2 PREPARATION

- A. Correct substrate irregularities that interfere with correct installation and alignment.
- B. Remove soiling and contaminants that impair adhesive bond.
- C. Inspect fabrications before installation. Discard fabrications that do not meet specified requirements, including uniformity of color and pattern. Discard fabrications with staining or abrasion damage that cannot be corrected satisfactorily at site before installation.

3.3 INSTALLATION

- A. Comply with applicable requirements of Section 01 7300.
- B. Install fabrications plumb, level, in plane, and correctly aligned.
- C. Fasten fabrications rigidly and securely in place.
 - 1. Adhesive Attachment: Maintain positive, uniform pressure until adhesive has cured sufficiently to maintain fabrications in place.
- D. Flush Seams: Use same products used for shop seams to produce flush, inconspicuous seams of same appearance as shop seams. Finish seams to match shop-finished surfaces.
- E. Finish exposed edges and surfaces that are cut for fitting to match shop-finished surfaces.
- F. After installation, inspect all exposed surfaces. Re-finish surfaces with scratches or other minor damage to match shop-finished surfaces. Repairs are subject to acceptance by Architect and Owner. Provide new replacement components for items that cannot be satisfactorily cleaned or repaired at site.

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END OF SECTION

**SECTION 07 2116
THERMAL BATT INSULATION**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Glass fiber blanket insulation for thermal protection.
- B. Related Requirements:
 - 1. Section 09 2900: Batt-type acoustical insulation.

1.2 INFORMATIONAL SUBMITTALS

- A. Submit letter stating that products will be provided per Owner's Bulk Purchasing List.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Acceptable manufacturers: Refer to the Owner's Bulk Purchasing Vendor List in Document 00 2150 for Owner's preferred manufacturer. Materials of manufacturers other than the preferred manufacturers which are of the same function and performance will be considered under provisions of Section 01 6000.
- B. Insulation: Unfaced formaldehyde-free fiberglass batts, thickness as indicated, complying with the property requirements of ASTM C665, Type 1, and ASTM E136. Use insulation wide enough to compress between building components and completely fill the cavity being insulated.
 - 1. Maximum flame characteristics: Flame Spread rating of 10, Smoke Development rating of 10 when tested in accordance with ASTM E84.
 - 2. Minimum thermal insulating value: R-value of 3 per inch thickness when tested in accordance with ASTM C518.
 - 3. Dimensional stability: Linear shrinkage less than 0.1%.
- C. Tie wire: 22 gage galvanized steel wire.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Preparation:
 - 1. Verify adjacent materials are dry and ready to receive insulation.
 - 2. Verify mechanical and electrical services within walls have been installed and tested.
 - 3. Coordinate the work of this Section with the work of Section 072610 for installation of vapor retarder materials.
- B. Install insulation in accordance with the manufacturer's printed instructions without voids or gaps. Use batts free of damage. Do not compress insulation.
- C. Trim insulation to neatly fit spaces. Insulate miscellaneous gaps.
- D. Fit insulation tight in spaces and tight to exterior side of mechanical, plumbing and electrical services within the plane of the insulation.

3.2 PROTECTION

- A. Protect installed insulation from weather damage.
- B. Replace insulation that becomes wet or is otherwise damaged with new insulation.

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**SECTION 07 2419
WATER DRAINAGE EIFS SYSTEM**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes: Water-drainage exterior insulation and finish system (EIFS) [<>] including liquid-applied air/moisture applied over gypsum sheathing.
- B. Related Sections:
 - 1. Division 04 Section "Unit Masonry" for concrete masonry unit substrate.
 - 2. Division 06 Section "Gypsum Sheathing" for sheathing.
 - 3. Division 07 Section "Joint Sealants" for joint sealants used in EIFS.

1.2 SYSTEM DESCRIPTION

- A. Water-Drainage Class PB EIFS: A non-load-bearing, exterior wall cladding system that consists of an insulation board attached adhesively to the substrate over a liquid applied air/moisture barrier in a manner allowing water entering into the system to drain to the exterior; an integrally reinforced base coat; and a textured protective finish coat as indicated on Drawing.

1.3 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: For each type and component of EIFS indicated.
- C. 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, and connections and attachments to other work.
- D. Samples for initial Selection: Submit manufacturer's color chart showing complete line of available colors and textures for selection by Architect.
 - 1. Coordinate submittal of color chart with submittal of joint sealant color samples specified in Division 07 Section "Joint Sealants."

1.4 INFORMATIONAL SUBMITTALS

- A. Installer Certificates:
 - 1. Signed by system manufacturer certifying that installers comply with specified requirements.
 - 2. Submit proof of payment and performance bonding for this specific project.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.
- C. Manufacturer Certificates: Signed by manufacturers certifying that EIFS and joint sealants comply with requirements.
- D. Material or Product Certificates: For base coat water resistant coating, adhesive, insulation, finish coat and joint sealant, from manufacturer.
- E. Sample Warranty: Submit unexecuted copy of EIFS manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For EIFS to include in maintenance manuals.
- B. Warranties: Special warranty specified in this Section.

1.6 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.
- B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.

1.7 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.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Maintain ambient temperatures above 40 deg F. for minimum 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.

1.9 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.

1.10 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of EIFS-clad drainage-wall assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Bond integrity and weathertightness.
 - b. Deterioration of EIFS finishes and other EIFS materials beyond normal weathering.
 - 2. Warranty coverage includes the following components of EIFS-clad drainage-wall assemblies:
 - a. EIFS finish, including base coats, finish coats, and reinforcing mesh.
 - b. Insulation installed as part of EIFS [$\leq$].
 - c. Insulation adhesive [$\leq$].
 - d. EIFS accessories, including trim components and flashing.
 - e. Water-resistive coatings.
 - f. EIFS drainage components.
 - 3. Warranty Period: Five years from date of Substantial Completion.
- B. Special Project Warranty: EIFS Installer's agrees to repair or replace components of EIFS-clad drainage-wall assemblies that fail in materials or workmanship within the following warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by manufacturers listed in Document 00 2150 - Owner's Preferred Vendor List. No substitutions permitted.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following and;
 - 1. Dryvit Systems, Inc., West Warwick, RI.
 - 2. Sto Corp.
 - 3. Substitutions: None allowed.
- C. Basis of Design: Sto Corp.; StoTherm Classic NEXt.

2.2 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 minimum 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 155.
 - 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 10 cycles per ICC-ES AC235.
 - 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. Tensile Adhesion: No failure in the EIFS, adhesive, base coat, or finish coat when tested per ICC-ES AC235.
 - 7. 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.
 - 8. 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.
 - 9. 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. High Impact Resistance: 90 to 150 inch-lb .
 - 10. Drainage: According to ICC-ES AC235.
 - 11. Structural Performance Testing: EIFS assembly and components shall comply with ICC-ES AC235 when tested per ASTM E 330.

2.3 MATERIALS

- A. Compatibility: Provide liquid-applied air/moisture barrier, adhesive, 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. Liquid-Applied Air/Moisture Barrier: 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 AC212.
 - 1. Sheathing Joint Compound and Self-Adhesive Mesh: Type recommended by EIFS manufacturer for sealing joints between and penetrations through sheathing, perimeters of sheathing, perimeters of rough openings, and other locations and conditions recommended by manufacturer.
- C. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; specifically formulated to be applied to back side of insulation in a manner that creates open vertical channels designed to serve as an integral part of the water-drainage system of the EIFS-clad drainage-wall assembly; compatible with substrate; and complying with the following:
 - 1. Factory-mixed, single-component, polymer-modified, cement-based dry powder material; self-gauging to achieve 1/16 inch base coat thickness in a single coat application.
- D. Molded or Extruded, Rigid Cellular Polystyrene Board Insulation: Comply with ASTM C 578, Type I or Type IV; 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. Aging: Before cutting and shipping, age insulation in block form by air drying for not less than 6 weeks or by another method approved by EIMA that produces equivalent results.
 - 2. Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, per ASTM E 84.
 - 3. Dimensions: Provide insulation boards maximum 24 by 48 inches and in thickness indicated but maximum 4 inches thick or less than thickness allowed by ASTM C 1397.
- E. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multi-end 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. High-Impact Reinforcing Mesh: Not less than 15 oz./sq yd.
 - 3. Strip Reinforcing Mesh: Not less than 3.75 oz./sq yd.
 - 4. Corner Reinforcing Mesh: Not less than 7.2 oz./sq yd.
- F. Base-Coat Materials: EIFS manufacturer's standard mixture complying with the following requirements:
 - 1. Factory-mixed, single-component, polymer-modified, cement-based dry powder material; self-gauging to achieve 1/16 inch base coat thickness in a single coat application.
- G. Finish-Coat Materials: EIFS manufacturer's standard acrylic-based coating complying with the following:
 - 1. Colors: As selected by Architect from manufacturer's full range. Match existing.
- H. Water: Potable.

2.4 TRIM ACCESSORIES

- A. General: Type as designated or required to suit conditions indicated and to comply with EIFS manufacturer recommendations; manufactured from UV-stabilized PVC; and complying with ASTM D 1784, manufacturer's standard Cell Class for use intended, and ASTM C 1063.
- B. Weep Screed/Starter Track:
 - 1. Prefabricated, one-piece extruded PVC type for attachment behind insulation with perforated face leg sloped and extended to form a drip, weep holes in track bottom of depth required to suit thickness of coating and insulation.

2. Face leg to be 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.
3. Thickness: 1/16 inch.
4. Width: As required to receive scheduled insulation thickness.
5. Basis of Design Products:
 - a. Vinyl Corporation No. CBS-16SDWF Starter Strip/Casing Bead.
 - b. Plastic Components; No. STDE.

2.5 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.
- B. Sealant Color: As selected by Architect from manufacturer's full range.

2.6 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. Substrate:
 1. Inspect the substrate to determine if it is in accordance with the Drawings, Specifications, and EIFS manufacturer's requirements.
 2. Promptly correct deficiencies.
 3. Acceptance of substrate, as further confirmed by commencement of EIFS application, precludes asserting substrate problems as a defense for product failure during the warranty period.
- D. 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 recommendations to obtain optimum bond between substrate and adhesive for insulation.

3.3 EIFS INSTALLATION, GENERAL

- A. Comply with EIFS manufacturer recommendations for installation of EIFS as applicable to each type of substrate indicated.

3.4 SUBSTRATE PROTECTION APPLICATION

- A. Liquid-Applied Air/Moisture Barriers: Apply over substrates to protect substrates from degradation and to provide water-/weather-resistive barrier.
 - 1. Ensure joints, exposed edges, terminations, and inside and outside corners of sheathing are sealed unless otherwise indicated by EIFS manufacturer recommendations.

3.5 TRIM INSTALLATION

- A. Trim: Apply trim accessories according to EIFS manufacturer recommendations. Coordinate with installation of insulation.
 - 1. Weep Screed/Starter Track: Use at bottom termination edges of water-drainage EIFS unless otherwise indicated. Provide splices and seal joints, intersections, and ends ensuring weeps remain clear.

3.6 INSULATION INSTALLATION

- A. Board Insulation: Adhesively attach insulation to substrate in compliance with ASTM C 1397, EIFS manufacturer recommendations, and the following:
 - 1. Apply adhesive on back of insulation by notched-trowel method in a manner that results in ridges forming vertical drainage channels leaving channels free of adhesive once insulation is adhered to substrate. Use properly sized notched trowel as recommended by manufacturer providing vertical drainage channels spaced as recommended by manufacturer.
 - 2. Apply adhesive to a thickness of not less than 1/4 inch, measured from surface of insulation before placement.
 - 3. Press insulation into place maintaining channels free of adhesive. Apply pressure over the entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.
 - 4. 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.
 - 5. Begin first course of insulation from weep screed/starter track and work upward.
 - 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. Interlock ends at internal and external corners.
 - 8. 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.
 - 9. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
 - 10. 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.
 - 11. 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.
 - 12. 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.
 - 13. 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.
14. Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and liquid-applied air/moisture barrier.

B. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch OD by 4 inches long.

3.7 BASE-COAT INSTALLATION

- A. Base Coat: Apply to exposed surfaces of insulation and foam shapes 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 recommendations. 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. Standard-impact reinforcing mesh unless otherwise indicated.
 2. High-impact reinforcing mesh where indicated. Butt joints; do not overlap.
 3. Provide impact-resistant reinforcing mesh at ground floor to minimum height of 10 feet, stopping only at a joint, reveal, or change in plane.
- C. Double-Layer Reinforcing Mesh Application: Where indicated, apply second base coat and second layer of standard-impact reinforcing mesh, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C 1397 and EIFS manufacturer recommendations in same manner as first application. Do not apply until first base coat has cured.
- D. Additional 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. Embed strip reinforcing mesh in base coat before applying first layer of reinforcing mesh.

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 selected by Architect from manufacturer's full range.

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 recommendations.
 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.

3.10 FIELD QUALITY CONTROL

- A. Correct deficiencies in or remove and replace EIFS that inspections and test reports indicate do not comply with requirements.

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.

3.12 ATTACHMENT

- A. HCA EIFS Quality Assurance Program Project Observation Form.
- B. © 2019 Gresham Smith. All rights reserved. Use subject to any written agreement with Gresham Smith.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION



DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

NOTICE OF ACCEPTANCE (NOA)

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION

11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786) 315-2590 F (786) 315-2599

www.miamidade.gov/economy

Sto Corporation

3800 Camp Creek Parkway

Bldg 1400, Ste 120

Atlanta, GA 30331

SCOPE: This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER-Product Control Section to be used in Miami-Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami-Dade County) and/ or the AHJ (in areas other than Miami-Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein and has been designed to comply with the Florida Building Code, including the High Velocity Hurricane Zone.

DESCRIPTION: Sto Therm ci LM 180 CMU EIF System – L.M.I.

APPROVAL DOCUMENT: Drawing titled "Sto Therm ci LM. 180. CMU. D", sheets 1 through 3 of 3, prepared by Sto Corporation, dated 10/21/2014 and last revised on 06/22/21, prepared by Sto Corporation, signed and sealed by Kurt W. Heinrichs, P.E., bearing the Miami-Dade County Product Control revision stamp with the Notice of Acceptance number and expiration date by the Miami-Dade County Product Control Section.

MISSILE IMPACT RATING: Large and Small Missile Impact Resistant

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state, model/series and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein. Components of this product come in different size buckets or drums. Each container needs to be labeled. Unit is further defined as each individual board of insulation and roll of reinforcing mesh.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/ or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA **revises** NOA #20-0211.04 and consists of this page 1 and evidence pages E-1, E-2 and E-3, as well as approval document mentioned above.

The submitted documentation was reviewed by **Ishaq I. Chanda, P.E.**



Ishaq I. Chanda

NOA No. 21-0708.13
Expiration Date: May 21, 2025
Approval Date: September 09, 2021
Page 1

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

1. EVIDENCE SUBMITTED UNDER PREVIOUS NOA's

A. DRAWINGS “Submitted under NOA # 15-0226.03”

1. Drawing titled “Sto Therm ci LM. 180. CMU. D”, sheets 1 through 3 of 3, prepared by Sto Corporation, dated 10/21/2014, signed and sealed by Kurt W. Heinrichs, P.E.

B. TESTS “Submitted under NOA # 15-0226.03”

1. Test reports on 1) Uniform Static Air Pressure Test, Loading per FBC TAS 202-94
2) Cyclic Wind Pressure Loading per FBC, TAS 203-94
along with marked-up drawings and installation diagram of a Sto Therm ci HI-CM-180 EIFS over CMU, prepared by Intertek/Architectural Testing, Inc., Test Report No. **D7521.01-550-18**, dated 09/12/2014, signed and sealed by Shawn G. Collins, P.E.

C. CALCULATIONS

1. None.

D. QUALITY ASSURANCE

1. Miami-Dade Department of Regulatory and Economic Resources (RER)

E. MATERIAL CERTIFICATIONS “Submitted under NOA # 15-0226.03”

1. Notice of Acceptance No. **11-1222.01**, issued to Carpenter Company, for their Carpenter EPS Block Type Insulation, approved on 11/29/2012, and expiring on 04/11/2017.

F. STATEMENTS “Submitted under NOA # 15-0226.03”

1. Statement letter of code conformance to the 2010 and 5th edition (2014) FBC issued by NOVA Engineering and Environmental, dated 02/16/2015, signed and sealed by Kurt W. Heinrichs, P.E.
2. Statement letter of no financial interest issued by NOVA Engineering and Environmental, dated 02/16/2015, signed and sealed by Kurt W. Heinrichs, P.E.

Ishaq I. Chanda

Ishaq I. Chanda , P.E.
Product Control Unit Supervisor
NOA No. 21-0708.13
Expiration Date: May 21, 2025
Approval Date: September 09, 2021

Sto Corporation

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

2. Evidence submitted under NOA #18-0319.14

A. DRAWINGS

1. Drawing No. Sto Therm ci LM. 180. CMU. D", sheets 1 through 3 of 3, prepared by Sto Corporation, dated February 2018, signed and sealed by Kurt W. Heinrichs, P.E.

B. TESTS

1. None.

C. CALCULATIONS

1. None.

D. QUALITY ASSURANCE

1. Miami-Dade Department of Regulatory and Economic Resources (RER)

E. MATERIAL CERTIFICATIONS

1. Notice of Acceptance No. **17-0417.01**, issued to Carpenter Company, for their Carpenter EPS Block Type Insulation, approved on 07/20/2017, and expiring on 04/11/2022.

F. STATEMENTS

1. Statement letter of code conformance to **FBC 6th Edition (2017)**, issued and prepared by NOVA Engineering and Environmental, dated 03/07/2018, signed and sealed by Kurt W. Heinrichs, P.E.

Ishaq I. Chanda

Ishaq I. Chanda , P.E.
Product Control Unit Supervisor
NOA No. 21-0708.13
Expiration Date: May 21, 2025
Approval Date: September 09, 2021

Sto Corporation

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

3. New Evidence submitted

A. DRAWINGS

1. Drawing titled “Sto Therm ci LM. 180. CMU. D”, sheets 1 through 3 of 3, prepared by Sto Corporation, dated 10/21/2014 and last revised on 06/22/21, prepared by Sto Corporation, signed and sealed by Kurt W. Heinrichs, P.E.

Note: This revision is for FBC 2020 update only.

B. TESTS

1. None.

C. CALCULATIONS

1. None.

D. QUALITY ASSURANCE

1. Miami-Dade Department of Regulatory and Economic Resources (RER).

E. MATERIAL CERTIFICATIONS

1. Notice of Acceptance No. **17-0417.01**, issued to Carpenter Company, for their Carpenter EPS Block Type Insulation, approved on 07/20/2017, and expiring on 04/11/2022.

F. STATEMENTS

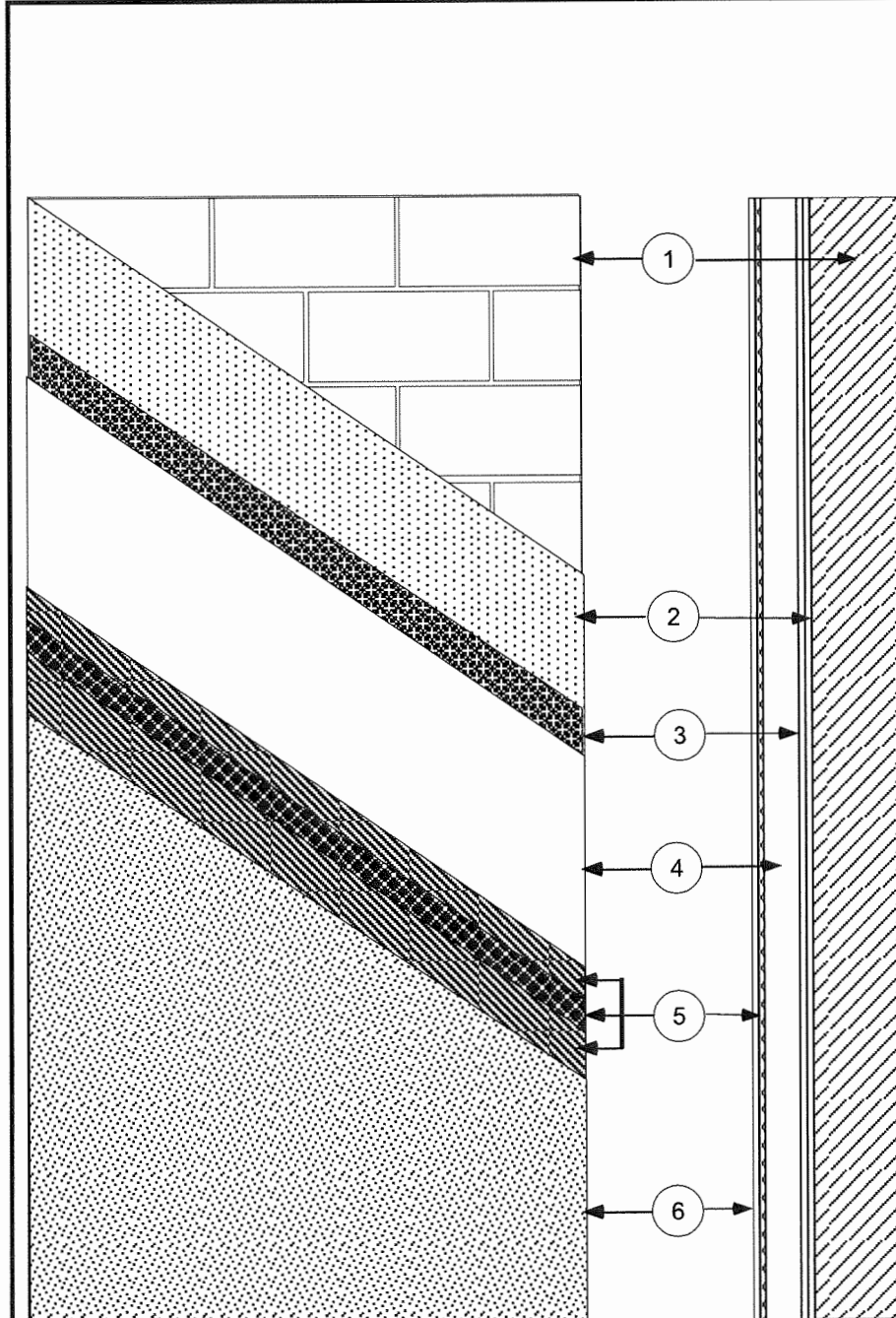
1. Statement letter of code conformance to **FBC 7th Edition (2020)**, issued and prepared by NOVA Engineering and Environmental, dated 06/22/21, signed and sealed by Kurt W. Heinrichs, P.E.
2. Statement letter dated June 16, 2021, issued by Sto requesting Product for FBC 2020 update, signed by Kevin Schroeder, Senior Tech Rep.

G. OTHER

1. This NOA revises NOA # **20-0211.04**, expiring 05/21/2025.

Ishaq I. Chanda

Ishaq I. Chanda , P.E.
Product Control Unit Supervisor
NOA No. 21-0708.13
Expiration Date: May 21, 2025
Approval Date: September 09, 2021



DESCRIPTION: STOTHERM CI HI-CM 180

COMPONENTS AND INSTALLATION

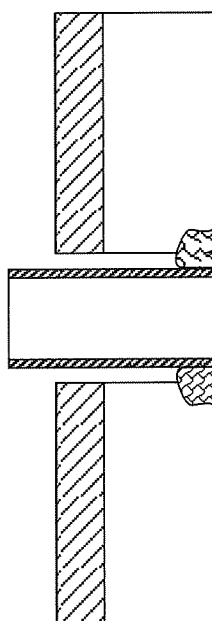
- 1 MINIMUM 8" WIDE CMU CONSTRUCTION COMPLYING WITH CURRENT MIAMI-DADE COUNTY NOA.
- 2 STO GOLD COAT AIR/MOISTURE BARRIER APPLIED PER MANUFACTURERS PUBLISHED PRODUCT INSTRUCTIONS.
- 3 STO PRIMER/ADHESIVE-B, APPLIED AS ADHESIVE TO EPS INSULATION BOARD. EPS SHALL COMPLY WITH CURRENT MIAMI-DADE COUNTY NOA.
- 4 MINIMUM 1" THICK EPS INSULATION BOARD. EPS SHALL COMPLY WITH CURRENT MIAMI-DADE COUNTY NOA.
- 5 STO MESH (4.5 OZ/SQ.YD.) EMBEDDED IN STO PRIMER/ADHESIVE-B. APPLIED AS ADHESIVE TO EPS INSULATION BOARD. EPS SHALL COMPLY WITH CURRENT MIAMI-DADE COUNTY NOA.
- 6 STO TEXTURED FINISH APPLIED PER MANUFACTURERS PUBLISHED PRODUCT INSTRUCTIONS.

GENERAL NOTES

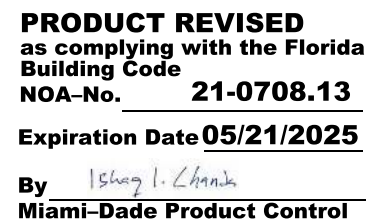
- 1 THIS SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE 2017 FLORIDA BUILDING CODE.
- 2 THIS SYSTEM HAS BEEN TESTED IN ACCORDANCE WITH TAS-203, STRUCTURAL AND CYCLIC TESTING.
- 3 THIS SYSTEM SHALL BE APPLIED BY A LICENSED PLASTERER IN ACCORDANCE WITH THE RECOMMENDATIONS OF STO CORP., THIS NOTICE OF COMPLIANCE IS A NOTICE OF THE FLORIDA BUILDING CODE.
- 4 THE ENGINEER AND/OR ARCHITECT OF RECORD FOR THIS PROJECT SHALL BE RESPONSIBLE FOR THE CONFORMANCE AS REQUIRED BY GOVERNING CODES.
- 5 INSULATION SHALL BE APPLIED IN A RUNNING BOND PATTERN.
6. ALL MASONRY CONCRETE MASONRY UNITS SHALL COMPLY WITH CURRENT MIAMI-DADE COUNTY NOA.
- 7 DETAILS ON PAGES 2 AND 3 OF THESE DRAWINGS ARE THE RESPONSIBILITY OF THE ENGINEER AND/OR ARCHITECT OF RECORD. ALTERATIONS TO THE TYPICAL DETAILS ARE THE RESPONSIBILITY OF THE ENGINEER AND/OR ARCHITECT OF RECORD WITH STO CORP.

Review by:



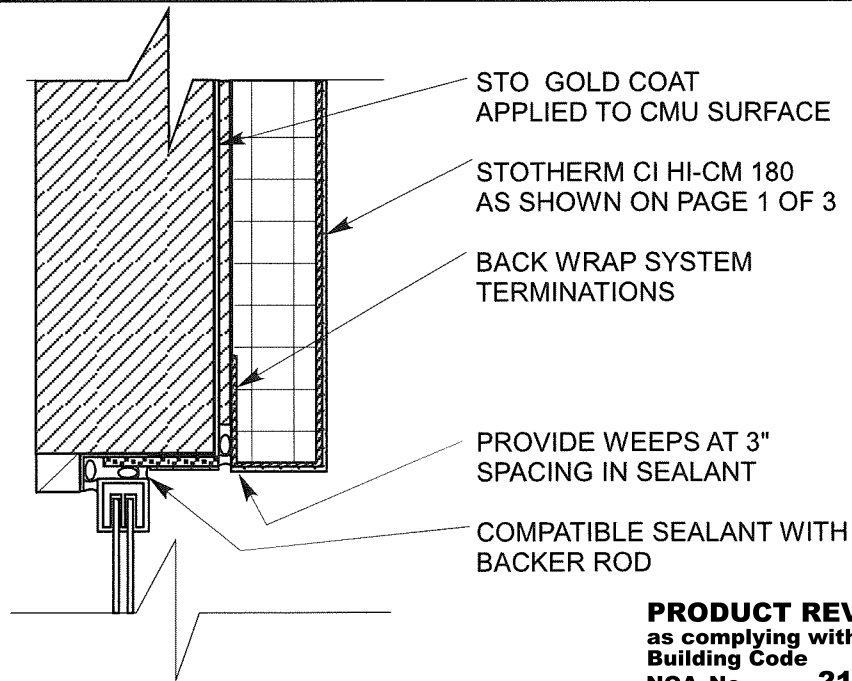


PIPE OR



Review by:



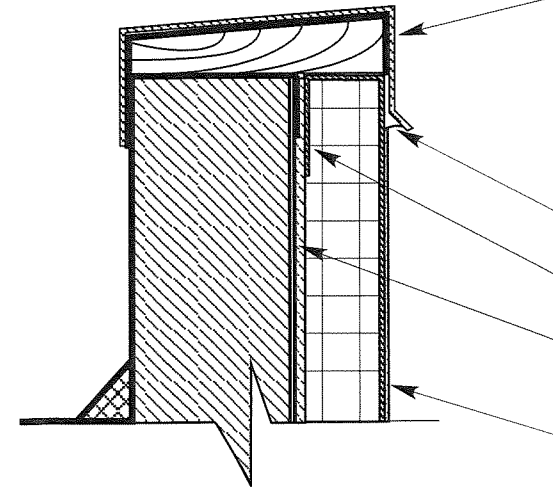


WINDOW HEAD

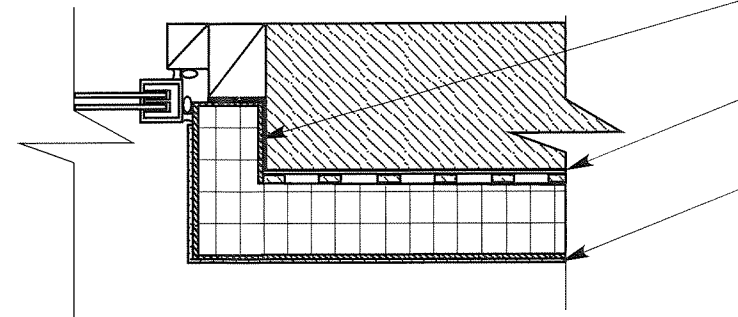
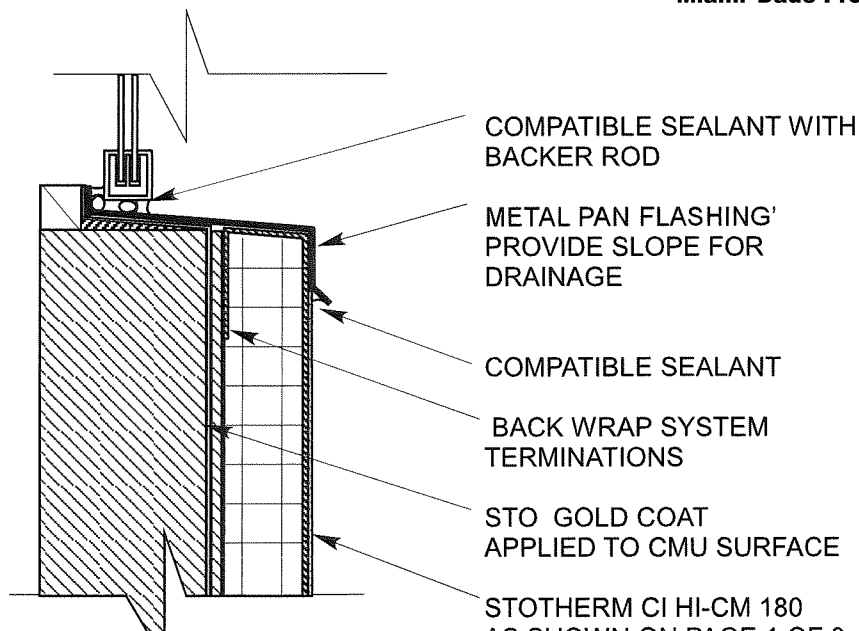
PRODUCT REVISED
as complying with the Florida
Building Code
NOA-No. **21-0708.13**

Expiration Date **05/21/2025**

By *Shag L. Chandra*
Miami-Dade Product Control



PARAPET CAP



WINDOW JAMB

Review by:



**SECTION 07 7100
ROOF SPECIALTIES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manufactured roof specialties, including copings, gravel stops, vents, and [_____].

1.2 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.
- B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems 2017.
- C. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates 2021.
- D. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films 2007 (Reapproved 2015).
- E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free 2007 (Reapproved 2018).
- F. NRCA (RM) - The NRCA Roofing Manual 2019.

1.3 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
- D. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.
- E. Sample Warranty: For manufacturer's special warranty.

1.4 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.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.6 WARRANTY

- A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section [_____].
- B. Special Warranty on Painted Finishes: 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 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 25 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 COMPONENTS

- A. Roof Edge Flashings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
 - 1. Configuration: Fascia, cant, and edge securement for roof membrane.
 - 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
 - 3. Exposed Face Height: As indicated on drawings.
 - 4. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
 - 5. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch thick, minimum.
 - 6. Finish: 70 percent polyvinylidene fluoride.
 - 7. Color: Match Existing.
- B. Copings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
 - 1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness, and finish as cap; concealed stainless steel fasteners.
 - 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.
 - 3. Wall Width: As indicated on drawings.
 - 4. Outside Face Height: As indicated on drawings.
 - 5. Inside Face Height: As indicated on drawings.
 - 6. Material: Formed aluminum sheet, 0.040 inch thick, minimum.
 - 7. Finish: 70 percent polyvinylidene fluoride.
 - 8. Color: [_____].

2.2 FINISHES

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; custom color to match approved sample.

2.3 ACCESSORIES

- A. Sealant for Joints in Linear Components: As recommended by component manufacturer.
- B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.
- C. Roof Cement: ASTM D4586/D4586M, Type I.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.2 INSTALLATION

- A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Seal joints within components when required by component manufacturer.
- C. Anchor components securely.
- D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.
- F. Coordinate installation of flashing flanges into reglets.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 07 8400
FIRESTOPPING**

PART 1 -GENERAL

1.1 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, and other openings indicated.

1.2 REFERENCE STANDARDS

- A. ASTM E1966 - Standard Test Method for Fire Resistive Joint Systems; 2007 (Reapproved 2011).
- B. ASTM E2837 - Standard Test Method for Determining Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2011.
- C. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Underwriters Laboratories Inc.; 2004.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Certificate from authority having jurisdiction indicating approval of materials used.

1.4 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
 - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
 - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Sole Source Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single sole source firestop specialty subcontractor.
- D. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Trained by the manufacturer.
 - 2. UL approved.

1.5 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of

materials.

- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 -PRODUCTS

2.1 FIRE-STOPPING, GENERAL REQUIREMENTS

- A. Manufacturers:
1. Hilti, Inc: www.us.hilti.com. Designs specified below are taken from Hilti catalogs.
 2. Substitutions: Refer to the Owner's Preferred Vendor List in Document 00 2150 for other acceptable manufacturers.
- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

2.2 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. Head-of-Wall Firestopping at Joints Between Non-Rated Floor and Fire-Rated Wall: Use any system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.
- B. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use any system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.
 2. Air Leakage: In addition, provide systems that have been tested to show L Rating as indicated.
 3. Watertightness: In addition, provide systems that have been tested to show W Rating as indicated.
 4. Listing by UL, FM, or Intertek in their certification directory will be considered evidence of successful testing.
- C. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
1. Temperature Rise: In addition, provide systems that have been tested to show T Rating as indicated.
 2. Air Leakage: In addition, provide systems that have been tested to show L Rating as indicated.
 3. Watertightness: In addition, provide systems that have been tested to show W Rating as indicated.
 4. Listing by UL, FM, or Intertek in their certification directory will be considered evidence of successful testing.
- D. Definition: Where 2 hour and 3 hour construction is specified below, the design specified is acceptable for use in applications of that rating and less.

2.3 FIRESTOPPING FOR FLOOR-TO-FLOOR, WALL-TO-FLOOR, AND WALL-TO-WALL JOINTS

- A. Gypsum Board Walls:
1. Wall to Wall Joints:
 - a. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
 2. Top of Wall Joints at Non-rated Roof Assemblies:
 - a. 1 Hour Construction: UL System HW-D-0488, HW-D-0489, HW-D-0490

2.4 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

- A. Blank Openings:
1. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
- B. Penetrations By:

1. Multiple Penetrations in Large Openings:
 - a. 1 Hour Construction: UL System W-L-1408; Hilti FS-ONE Intumescent Firestop Sealant.
 - b. 1 Hour Construction: UL System W-L-8071; Hilti FS-ONE Intumescent Firestop Sealant.
 - c. 1 Hour Construction: UL System W-L-8079; Hilti FS-ONE Intumescent Firestop Sealant.
 - d. 1 Hour Construction: UL System W-L-8087; Hilti FS 657 Fire Block.
2. Uninsulated Metallic Pipe, Conduit, and Tubing:
 - a. 1 Hour Construction: UL System W-L-1054; Hilti FS-ONE Intumescent Firestop Sealant.
 - b. 1 Hour Construction: UL System W-L-1164; Hilti FS-ONE Intumescent Firestop Sealant.
 - c. 1 Hour Shaftwall Construction: UL System W-L-1206; Hilti FS-ONE Intumescent Firestop Sealant.
3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
 - a. 1 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
 - b. 1 Hour Construction: UL System W-L-2474; Hilti FS-ONE Intumescent Firestop Sealant.
4. Electrical Cables Not In Conduit:
 - a. 1 Hour Construction: UL System W-L-3065; Hilti FS-ONE Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
 - b. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
 - c. 1 Hour Construction: UL System W-L-3395; Hilti CP653 Speed Sleeve.
5. Insulated Pipes:
 - a. 1 Hour Construction: UL System W-L-5028; Hilti FS-ONE Intumescent Firestop Sealant.
 - b. 1 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
6. HVAC Ducts, Insulated:
 - a. 1 Hour Construction: UL System W-L-7156; Hilti FS-ONE Intumescent Firestop Sealant.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install damming materials to arrest liquid material leakage.

3.3 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.
- C. Install labeling required by code.

3.4 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.5 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

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END OF SECTION

**SECTION 07 9200
JOINT SEALANTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Joint backings and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping: Firestopping sealants.
- B. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.
- C. Section 08 8000 - Glazing: Glazing sealants and accessories.
- D. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- E. Section 09 2216 - Non-Structural Metal Framing: Sealing between framing and adjacent construction in acoustical and sound-rated walls and ceilings.
- F. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.
- G. Section 23 3100 - HVAC Ducts and Casings: Duct sealants.

1.3 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015.
- B. ASTM C834 - Standard Specification for Latex Sealants 2017.
- C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2018.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

1.4 SUBMITTALS

- A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Substrates for which use of primer is required.
 - 6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
 - 7. Sample product warranty.
 - 8. Certification by manufacturer indicating that product complies with specification requirements.
- B. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.6 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. Joints between different exposed materials.
 - c. Other joints indicated below.
 - 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
 - 1) Exception: Such gaps and openings in gypsum board and plaster finished stud walls and suspended ceilings.
 - 2) Exception: Through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
 - c. Other joints indicated below.
 - 3. Do not seal the following types of joints.
 - a. Intentional weepholes in masonry.
 - b. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
 - c. Joints where installation of sealant is specified in another section.
 - d. Joints between suspended panel ceilings/grid and walls.
- B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
- C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
 - 1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
 - 2. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
- D. Interior Wet Areas: Bathrooms, restrooms, and food service areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

2.2 NONSAG JOINT SEALANTS

- A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 50 percent, minimum.
 - 2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 - 3. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 - 4. Color: Match adjacent finished surfaces.

5. Cure Type: Single-component, neutral moisture curing.
 6. Service Temperature Range: Minus 20 to 180 degrees F.
 7. Manufacturers:
 - a. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle.
 - b. Dow; DOWSIL 791 Silicone Weatherproofing Sealant: www.dow.com/#sle.
 - c. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com/#sle.
 - d. Sika Corporation; Sikasil WS-295: www.usa.sika.com/#sle.
 - e. Tremco Commercial Sealants & Waterproofing; Spectrem 3: www.tremcosealants.com/#sle.
- B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: White.
 2. Manufacturers:
 - a. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.
 - b. Sika Corporation; Sikasil GP: www.usa.sika.com/#sle.
- C. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
 3. Color: Match adjacent finished surfaces.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Manufacturers:
 - a. Pecora Corporation; DynaTrol II: www.pecora.com/#sle.
 - b. Pecora Corporation; DynaFlex: www.pecora.com/#sle.
 - c. Sherwin-Williams Company; Stampede-1/-TX Polyurethane Sealant: www.sherwin-williams.com/#sle.
 - d. Sherwin-Williams Company; Stampede 2NS Polyurethane Sealant: www.sherwin-williams.com/#sle.
 - e. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com/#sle.
 - f. Tremco Commercial Sealants & Waterproofing; Dymonic 240 FC: www.tremcosealants.com/#sle.
 - g. Tremco Commercial Sealants & Waterproofing; Vulkem 116: www.tremcosealants.com/#sle.
 - h. W. R. Meadows, Inc; POURTHANE NS: www.wrmeadows.com/#sle.

2.3 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
- B. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- C. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.2 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.3 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- E. Install bond breaker backing tape where backer rod cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

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END OF SECTION

**SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES**

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware.
- B. Section 08 8000 - Glazing: Glass for doors and windows.

1.2 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- H. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- I. FBC TAS 201 - Impact Test Procedures; Testing Application Standard; 1994.
- J. FBC TAS 202 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure; Testing Application Standard; 1994.
- K. FBC TAS 203 - Criteria for Testing Products Subject To Cyclic Wind Pressure Loading; Testing Application Standard; 1994.
- L. FLA (PAD) - Florida Building Code Online - Product Approval Directory; database at www.floridabuilding.org.
- M. Florida Accessibility Code, Seventh Edition.
- N. Miami (APD) - Approved Products Directory; Miami-Dade County; database at www.miamidade.gov/development/product-control.asp.
- O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- P. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.
- Q. SDI 111 - Recommended Standard Details for Steel Doors & Frames; 2009.
- R. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.3 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Wind-Borne-Debris Resistance Approval Documentation: Provide the manufacturer's current approved documentation of equivalent NOA or Florida Building Code approval as acceptable to the authorities having jurisdiction.
- D. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
 - 1. Indicate frame configurations, anchor types and spacing, location of cutouts for hardware, reinforcement, to ensure doors and frames are properly prepared and coordinated to receive hardware.
 - 2. Indicate door elevations, internal reinforcement, closure method, and cutouts for items such as, but not limited to, glass lights and louvers.
- E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- F. Distributor's Personnel Qualifications: Identify individuals credentialed as Architectural Openings Consultant, Architectural Hardware Consultant, Certified Door Consultants and Electrified Hardware Consultant.
- G. Submittals not including all of the requirements of this Article will be considered incomplete, will not be reviewed, and will be returned directly to the Contractor

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- B. Distributor Qualifications: Company regularly engaged in distribution of hollow metal doors and frames with contacts credentialed as an Architectural Openings Consultant (AOC) assigned to be available to consult with the Architect regarding matters affecting this Project's openings.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

1.5 REQUIREMENTS FOR RATED OPENINGS

- A. Comply with requirements of the code having jurisdiction for fire rated door frames, window frames, and sidelite frames, and doors for the rating class indicated.
 - 1. Label fire doors and frames listed in accordance with Underwriters Laboratories standard UL10C, and Positive Pressure Fire Tests of Door Assemblies.
 - 2. In case of conflicts in required fire protection ratings, provide fire ratings as required by NFPA and UL.
- B. Labeling Agency:
 - 1. If labeling agency is Underwriters' Laboratories: Manufacture doors and frames under the UL factory inspection program and in strict compliance to UL procedures, and provide the degree of fire protection, heat transmission and panic loading capability indicated by the opening class.
 - 2. If labeling agency is Intertek Testing Services/Warnock Hersey: Manufacture doors and frames under the ITS/WH factory inspection program and in strict compliance to ITS/WH procedures, and provide the degree of fire protection capability indicated by the opening class.
- C. Have metal labels, bearing the name of the labeling agency, shipped on items located as follows:
 - 1. Door Frames: Placed on the rabbet between the two upper hinge locations so as to be concealed when doors are shut.

2. Doors: Placed on the hinge stile between the two upper hinge locations so as to be concealed when doors are shut.
 3. Window frames: Placed on the public side rabbet approximately 5 feet above finished floor - do not place on the face of the frame.
- D. The following label materials/methods will not be acceptable and will be cause for rejection of all work of this Section:
1. Paper or plastic labels.
 2. Stamped or embossed label markings.
 3. Loose labels to be applied at the site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.
1. Do not use non-vented plastic or canvas shelters, which create a humidity chamber and promote rusting.
 2. If items become wet, or moisture appears, remove protective wrapping immediately and take measures to dry items.
- C. Store items in an enclosed space not subject to precipitation.
1. Store frames in an upright position with heads uppermost under cover on wood sills on floors in a manner that will prevent rust and damage. Do not store more than five in a stack. Provide a 2 inch space between frames to permit air circulation.
 2. Store doors vertically. Place the units on at least 4 inch high wood sills on floors in a manner that will prevent rust and damage. Provide a 4 inch space between the doors to permit air circulation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
1. Refer to the Owner's Bulk Purchasing Vendor List in Document 00 2150 for the Owner's sole source manufacturer - No substitutions.
 - a. Basis of Design - Frames: Steelcraft F Series.
 - b. Basis of Design - Exterior Doors: Steelcraft H-Series, Florida Building Code Approval FL12400-R6.

2.2 DESIGN CRITERIA

- A. Requirements for Hollow Metal Doors and Frames:
1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
 2. Accessibility: Comply with Florida Accessibility Code, Seventh Edition.
 3. Door Edge Profile: Beveled, both sides.
 4. Vertical Edge Seams on Doors: Continuous vertical mechanical inter-locking joints at lock and hinge edges with visible edge seams, or a one piece full height 14 gage channel
 5. Typical Door Face Sheets: Flush.
 6. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - a. Coordinate with approved hardware schedule provided under Section 08 7100 - Door Hardware for frames to be prepped for silencers and frames to be left un-punched to receive gasketing or weatherstripping.
 - b. Silencer preparation: Punch or drill frames for resilient rubber type, specified in Section 08 7100.
 - 1) Single Doors: 3 on strike side jamb.
 - 2) Pairs With No Center Mullion: 2 on head.

- c. Mortises: Prepare mortises to fit hardware. Coordinate location of mortises with locations of door hardware items.
- d. Reinforcements:
 - 1) Mortise Hinges: Minimum 7 gage (0.180 inch).
 - a) Provide high frequency hinge reinforcement for top hinge on all exterior, and cross corridor frames, in accordance with SDI 111-H, Example "A" Application, where full mortise hinges are specified.
 - 2) Strikes: Minimum 16 gage (0.053 inch) and prepared for an ANSI-A115.1-2 strike.
 - 3) Closers: Minimum 14 gage (0.067 inch) steel.
 - 4) Provide adequate reinforcements for other hardware as required.
 - 5) Provide reinforcements to be galvanized in galvanized/galvannealed frames.
 - 6) Projection weld hinge and strike reinforcements to the door frame.
 - 7) Provide metal plaster guards for all mortised cutouts.
- 7. Frame Welds: Factory die-mitered corner connections reinforced with four integral tabs to secure and interlock at jambs to head. Continuously face-weld joints. Grind and finish all exposed surfaces of joints so that no traces of the mitered joints are visible. Frames showing traces of mitered joints are not acceptable.
 - a. Note: The remaining elements at miters between jambs and head (soffit, stop and rabbets) are not required to be welded.
- 8. Frame Returns:
 - a. Metal Stud Walls: Provide standard returns for all frames in metal stud walls. Size returns between frame face as follows:
 - 1) Frames with Resilient Base Abutting Frame: 1/2 inch.
 - 2) Frames Where Sheet Flooring with Coved Base Occurs: 3/4 inch.
 - 3) Frames in Walls Where No Base is Scheduled: 1/2 inch.
- 9. Frame Anchors: Each jamb to have:
 - a. Frames in Metal Stud Walls: One floor clip and one metal stud anchor for each two feet of frame height.
- B. Electrical Requirements: Coordinate electrical requirements for doors and frames. Make provisions for installation of electrical items arranged so that wiring can be readily removed and replaced.
 - 1. Openings With Electrified Hinges: Furnish conduit raceway to permit wiring from electric door hardware.
 - a. Hinge Locations: Provide electric hinge at intermediate or center location. Top or bottom electric hinge locations are not acceptable.
 - b. Refer to Section 08 7100 - Door Hardware for electrified hardware items
- C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Interior Doors, Non-Fire Rated:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - 2. Core Material: Non-foam plastic type standard with the manufacturer.
 - 3. Reinforcing: Channel shaped vertical stiffeners at 6 inches o.c., welded to both sheets.
 - 4. Door Thickness: 1-3/4 inch, nominal.
- C. Fire-Rated Doors:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.

- d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - 2. Fire Rating: As indicated on drawings, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 - a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - b. Attach fire rating label to each fire rated unit.
 - 3. Core Material: Mineral board.
 - 4. Reinforcing: Channel shaped vertical stiffeners at 6 inches o.c., welded to both sheets.
 - 5. Door Thickness: 1-3/4 inch, nominal.
- D. Hurricane Resistant Doors:
- 1. Comply with Florida Building Code (FBC) test protocols for High Velocity Hurricane Zone (HVHZ) FBC TAS 201, FBC TAS 202 and FBC TAS 203.
 - 2. Design and size door and frame components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M.
 - a. Design Wind Loads: Comply with requirements of authorities having jurisdiction.
 - b. Wind-Borne Debris Resistance: Door and frame components shall have FLA (PAD) approval or Miami (APD) approval for Large and Small Missile impact and pressure cycling at design wind loads.
 - 3. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 3 - Extra Heavy-duty.
 - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 - 4. Core Material: Manufacturers standard core material/construction and in compliance with requirements for stiffness and insulating requirements.
 - 5. Door Thickness: 1-3/4 inch, nominal.
 - 6. Top Closures: Flush with top of faces and edges.

2.4 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Interior Door Frames, Non-Fire Rated: Face welded type.
 - 1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 - 2. Frame Finish: Factory primed and field finished.
- C. Door Frames, Fire-Rated: Face welded type.
 - 1. Fire Rating: Labelled as a fire rated frame.
 - 2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 - 3. Frame Finish: Factory primed and field finished.
- D. Hurricane Resistant Door Frames: With same hurricane resistance as door; face welded construction, ground smooth, fully prepared and reinforced for hardware installation.
 - 1. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
- E. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
- F. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings. Additionally, meet the following:
 - 1. Welds: Continuously weld joints along all surfaces along the throat of the frames. Grind and finish all exposed surfaces of joints so that no traces of the mitered joints are visible. Frames showing traces of mitered joints are not acceptable.
 - 2. Anchors: One anchor appropriate for the surrounding construction for each 2 feet of jamb height in each jamb.

2.5 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.6 ACCESSORIES

- A. Glazing: As specified in Section 08 8000, factory installed.
- B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered corners; prepared for countersink style tamper proof screws.
- C. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.2 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and with Steel Door Institute's ANSI A250.11 recommended erection instructions for steel frames.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Coordinate installation of hardware.
- E. Coordinate installation of glazing.
- F. Coordinate installation of electrical connections to electrical hardware items.
- G. Touch up damaged factory finishes.
 - 1. Sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
 - 2. Leave touched-up areas without blemishes that will affect adherence or appearance of final paint coatings.

3.3 TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.4 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Adjust sound control doors so that seals are fully engaged when door is closed.
- C. Test doors with gasketing for weather, fire, smoke, or sound for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

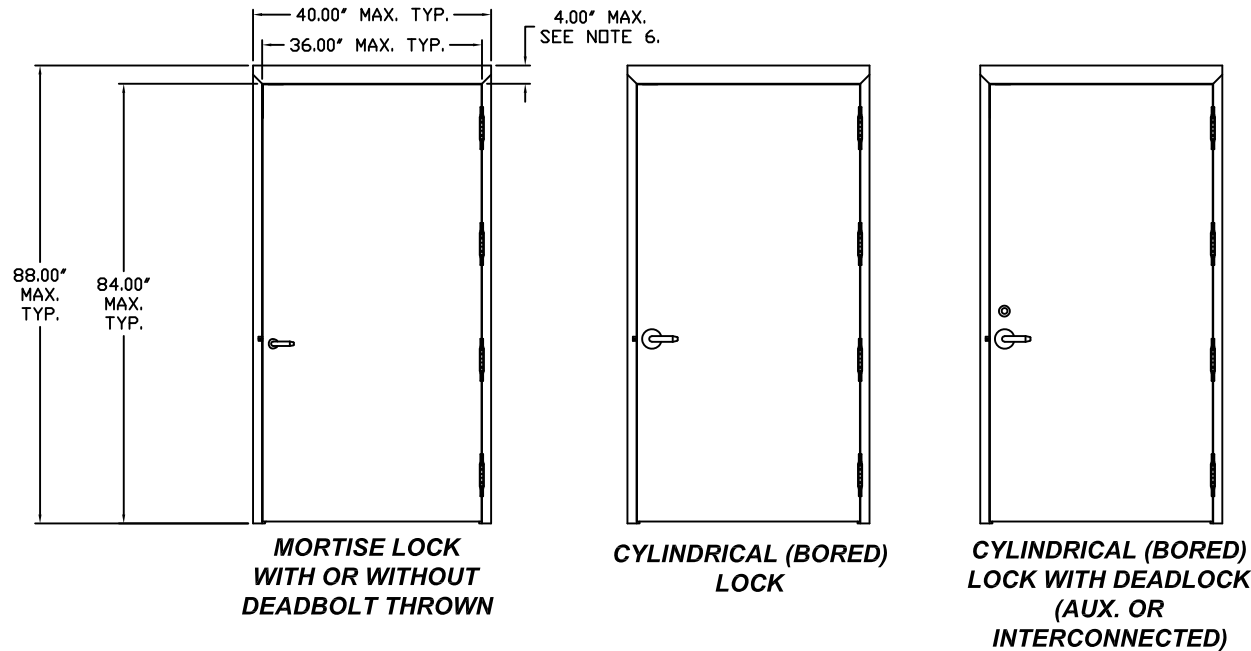
3.5 PROTECTION

- A. Provide protective measures required throughout the construction period to ensure that door and frame units will be without damage or deterioration, other than normal weathering, at time of acceptance.

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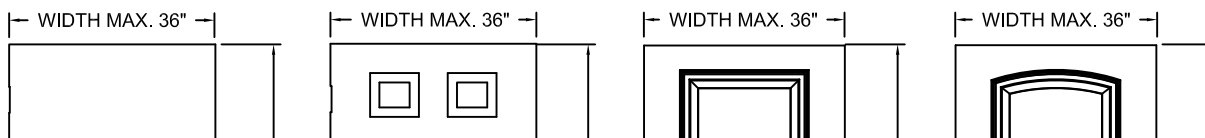
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HDWE FAMILY	LOCKING HARDWARE	DESIGN PRESSURE	IMPACT
MORTISE LOCK	SCHLAGE: L9000, L9400, LE-MS, LEB-MS, LE-MB, LEB-MB, LE-MD, LEB-MD AD-MS, CO-MS, AD-MD AND CO-MD SERIES FALCON: MA SERIES	+70/-70 PSF OUTSWING	LARGE AND SMALL MISSILE IMPACT, LARGE MISSILE IMPACT 50 F/S
CYLINDRICAL (BORED) LOCK	SCHLAGE: A, AL, ALX (W/ 13-247 LATCH), ND, NDE, NDEB, AD-CY AND CO-CY SERIES WITH 1/2" LATCH THROW FALCON: T, TX, B, X WITH 1/2" LATCH THROW		
CYLINDRICAL (BORED) LOCK WITH DEADLOCK (AUX. OR INTERCONNECTED)	SCHLAGE S200 SERIES (S210/251/270/280 OR H100 SERIES (H110/153/180/185) INTERCONNECTED ENTRANCE LOCK DEXTER J-SERIES (J10/40/54) WITH JD-SERIES (JD60/62) DEADBOLT OR JH-SERIES HANDLESET WITH DEADBOLT (JH60/62)	+67/-67 PSF OUTSWING	LARGE AND SMALL MISSILE IMPACT, LARGE MISSILE IMPACT 50 F/S

* SEE SHEET 7 FOR APPROVED GASKETING WHEN WATER INFILTRATION REQUIREMENTS ARE IN PLACE
SEE SHEET 8 FOR APPROVED GASKETING WHEN WATER INFILTRATION REQUIREMENTS ARE NOT IN PLACE

AVAILABLE DOOR PANEL CONFIGURATIONS



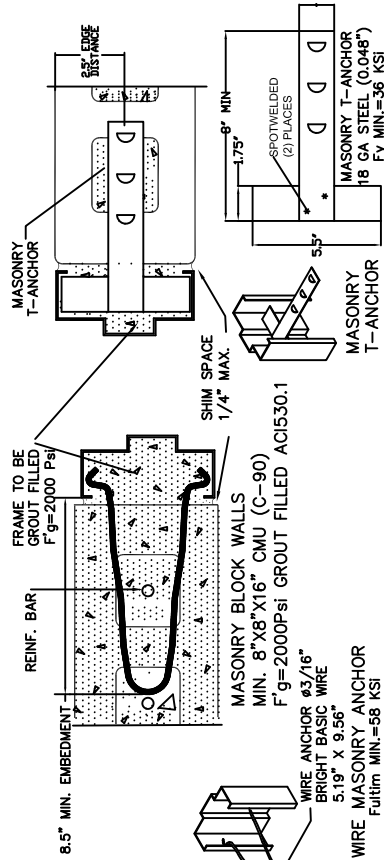
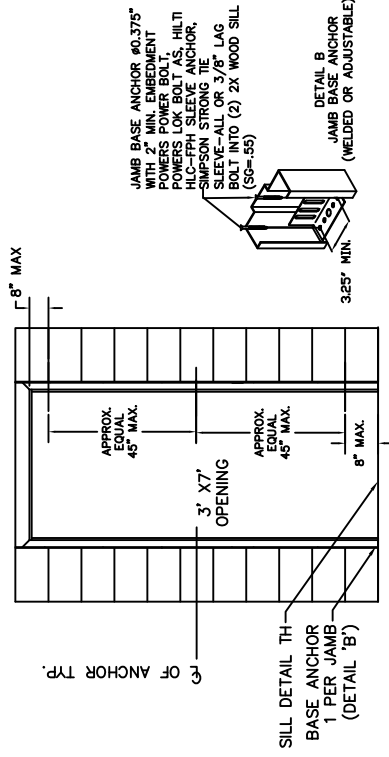
Digitally signed by Hermes F Norero
Reason: I am approving this document

GENERAL NOTES:
1. THESE PRODUCTS
E330-14, E331-00(09) A

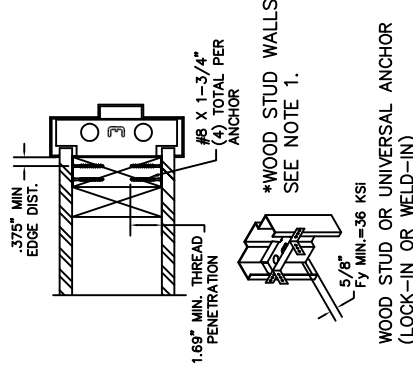
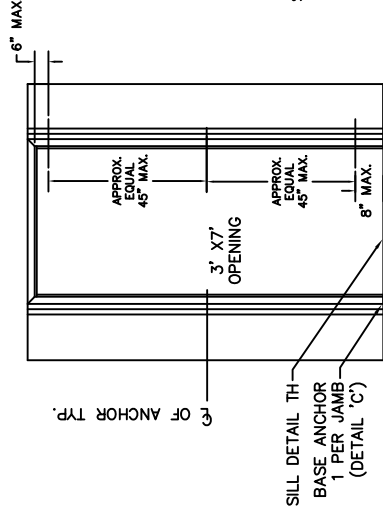
NOTES:
1. ALL DIMENSIONS S
2. ANCHOR REQUIRE
SEE SHEET 3 FOR
3. HINGE REQUIREME
FOR DOOR OPENIN
LOCATIONS: 7.125
9" M
NOT

APPROVED CONTIN
4. SEE SHEET 5 FOR
5. HARDWARE INSTA
6. 4" FACE HEAD IS
7. APPLY CAULK TO F
SHEETS 7 AND 8.
8. WHEN WATER INFI
9. SEE SHEET 7 FOR
10. ELECTRICAL INST
THE CORRESPONDIN
11. OPTIONAL POWER
ALLOWED BY CODE A
BE REVIEWED BY TH

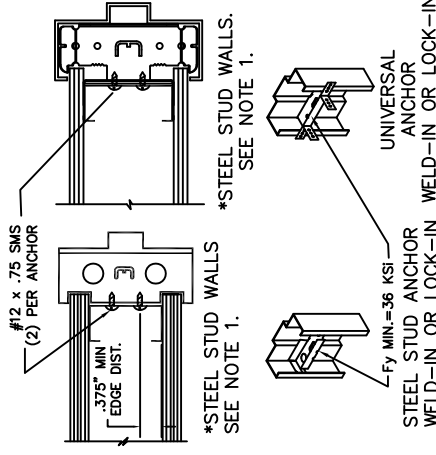
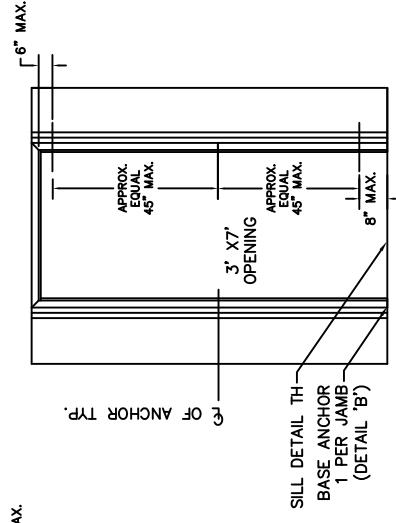
A MASONRY ANCHOR INTO GROUT FILLED FRAME AND BLOCK WALL



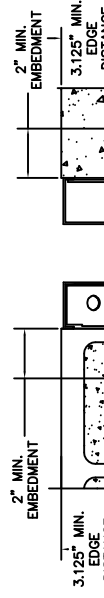
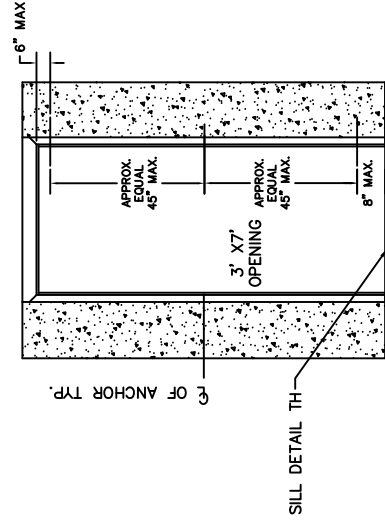
B WOOD STUD ANCHOR



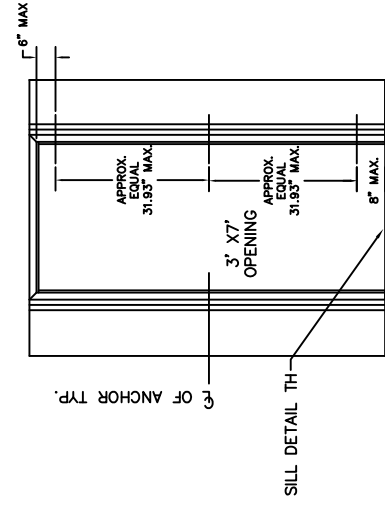
C STEEL STUD ANCHOR



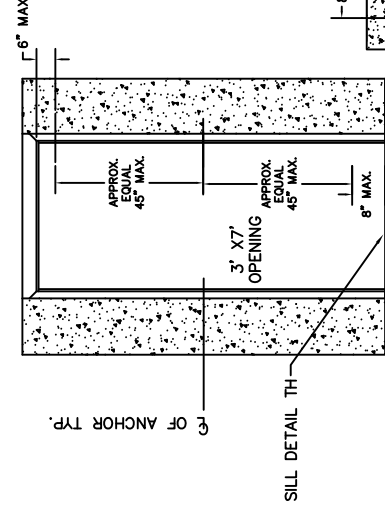
D EXISTING MASONRY ANCHOR (EMA) INTO CONCRETE WALL OR CMU



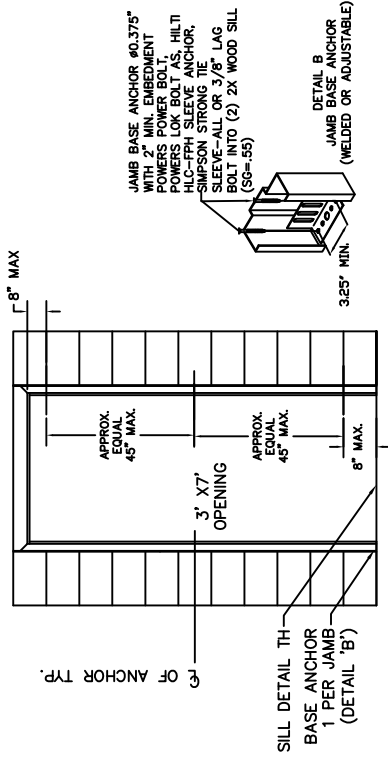
E EXISTING MASONRY ANCHOR (EMA) WITH LAG BOLT INTO WOOD STUD WALL



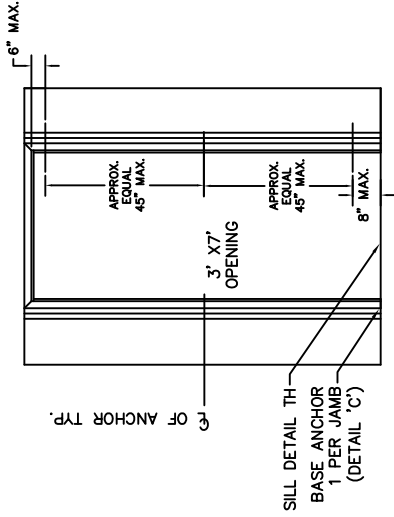
F POURED CONCRETE TILT UP WALL CONSTRUCTION



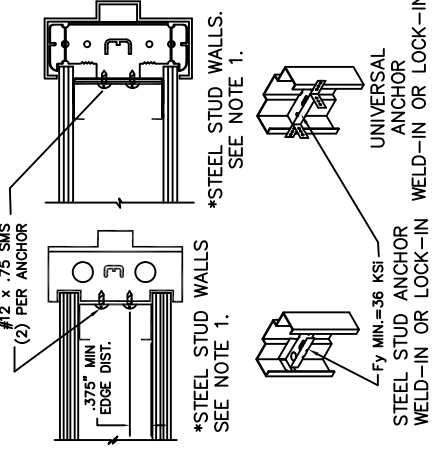
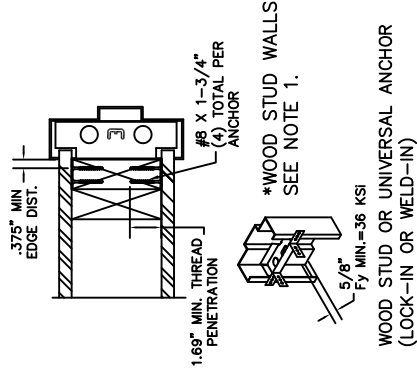
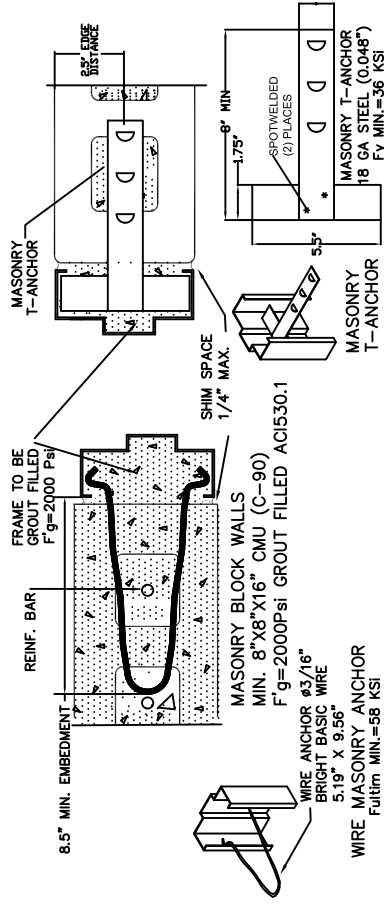
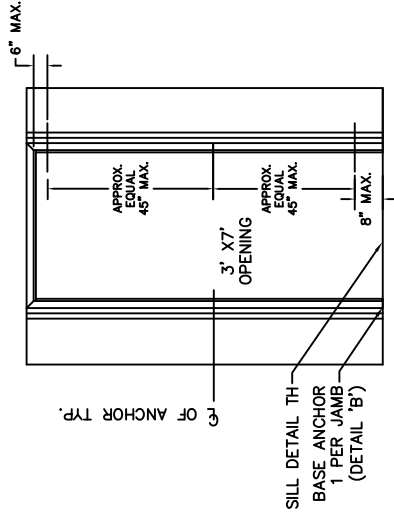
A MASONRY ANCHOR INTO GROUT FILLED FRAME AND BLOCK WALL



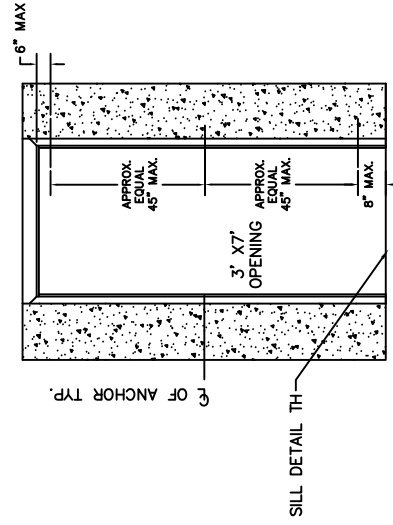
B WOOD STUD ANCHOR



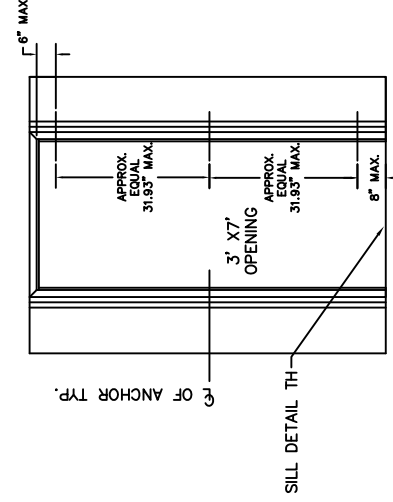
C STEEL STUD ANCHOR



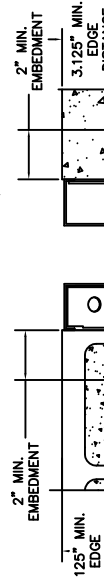
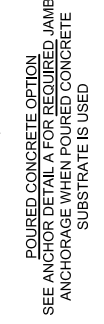
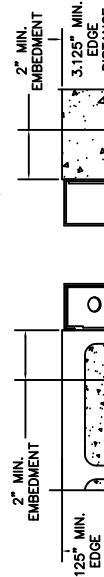
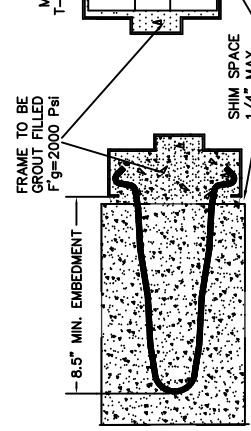
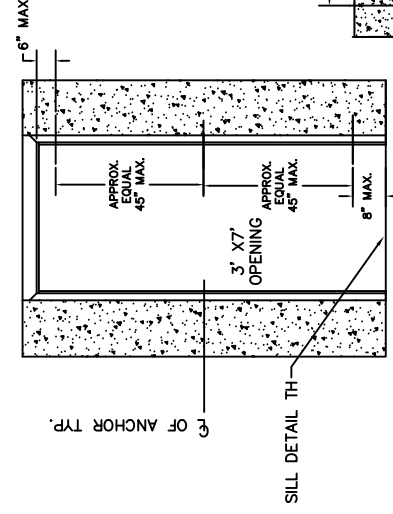
D EXISTING MASONRY ANCHOR (EMA) INTO CONCRETE WALL OR CMU



E EXISTING MASONRY ANCHOR (EMA) WITH LAG BOLT INTO WOOD STUD WALL



F POURED CONCRETE TILT UP WALL CONSTRUCTION



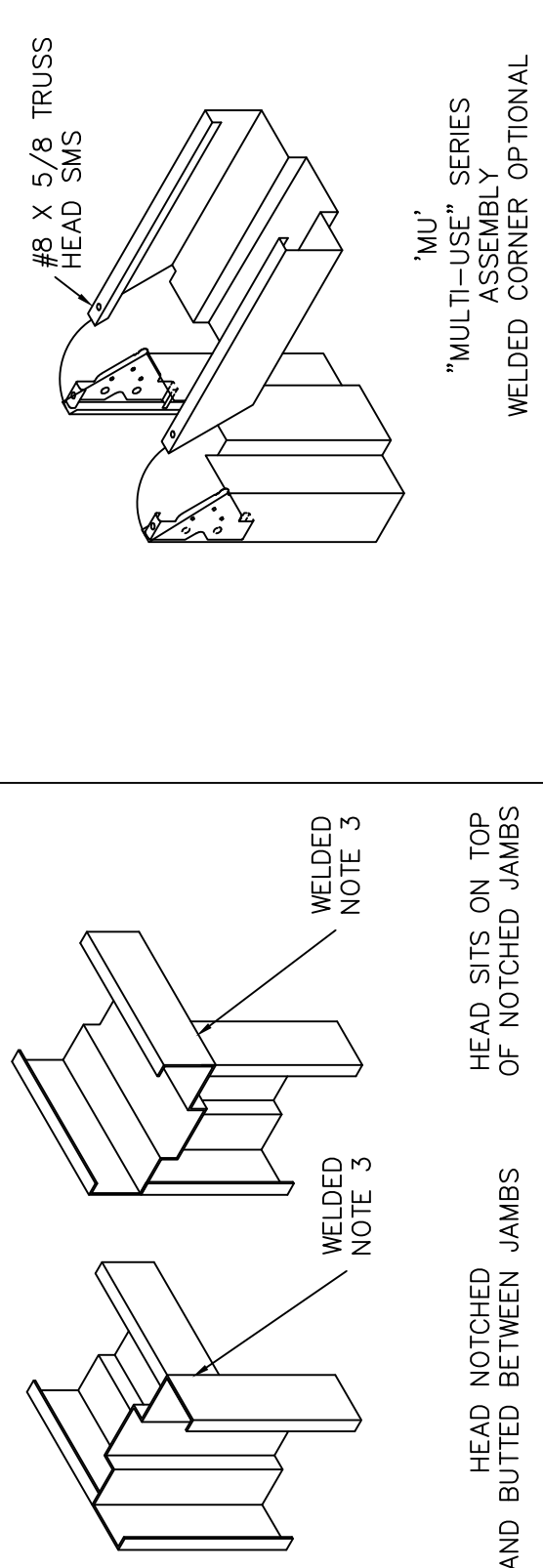
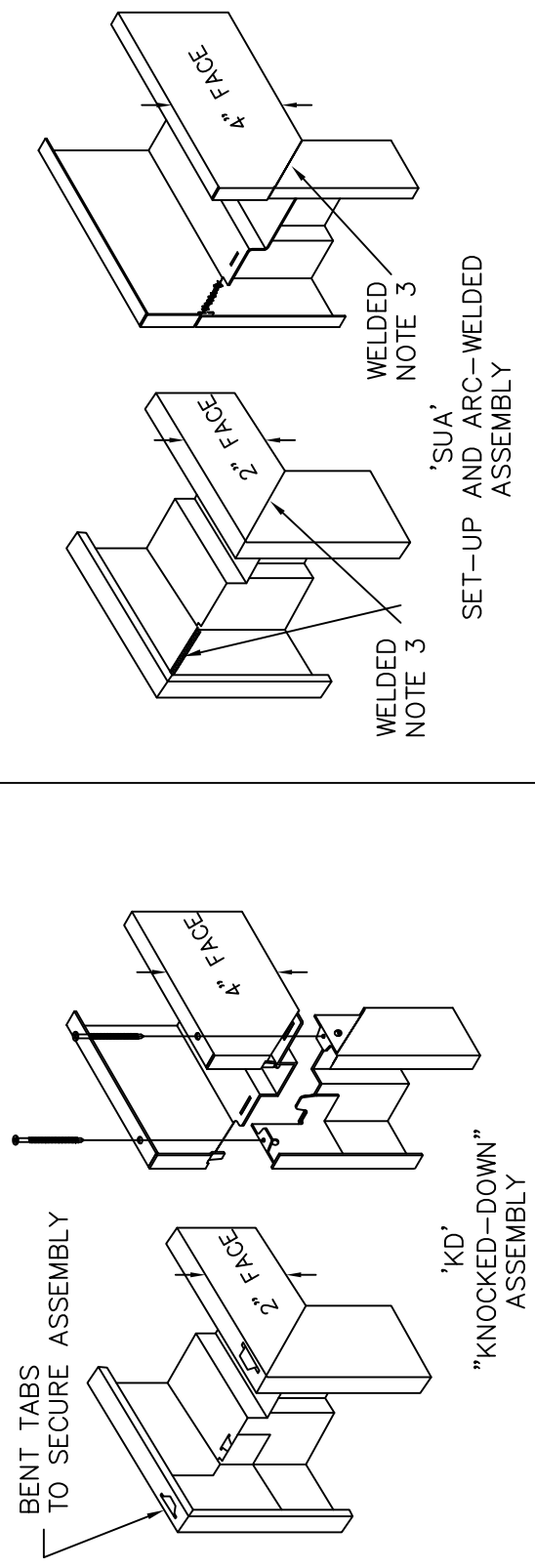
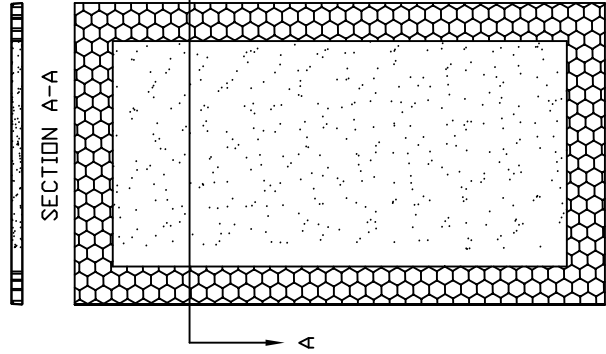
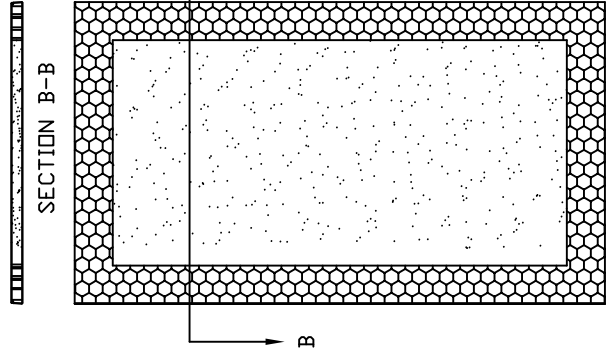


TABLE 1. AVAILABLE FRAME CONFIGURATIONS

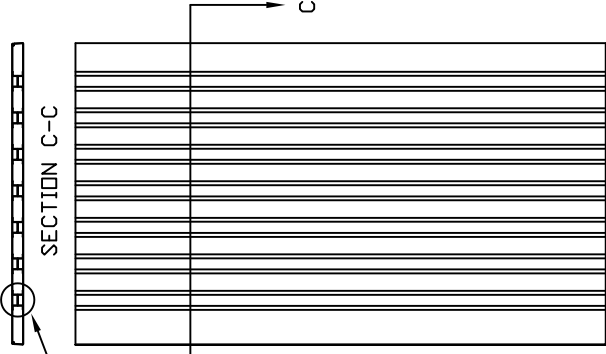
FRAME SERIES	JAMB DEPTH	MAXIMUM DOOR OPENING SIZE		MATERIAL	
		WIDTH	HEIGHT	DESCR.	GAL./MIN. THK
F	5.75" MIN.	3'0"	7'0"	CRS/HRS GALV	16/.053"
				14/.067"	12/.099"
				STAINLESS STEEL	16/.053"



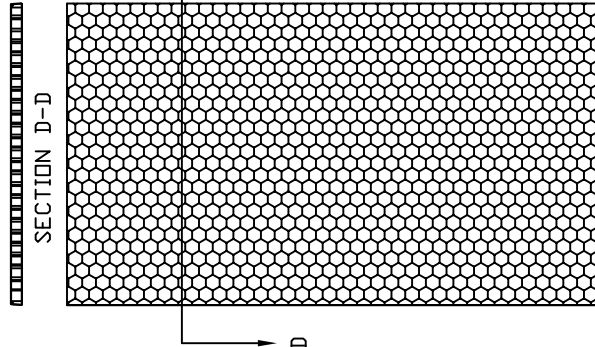
(A) POLYSTYRENE
EXPANDED POLYSTYRENE FOAM
GRADES 54 AND 86
DENSITY: 1.0 LB/CUFT



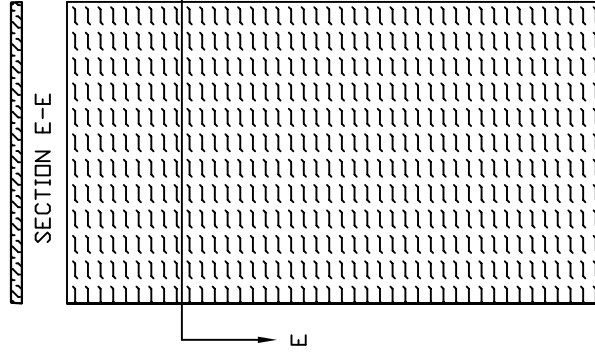
(B) POLYURETHANE
ELFOAM H200
DENSITY: 2.0 LBS/CUFT



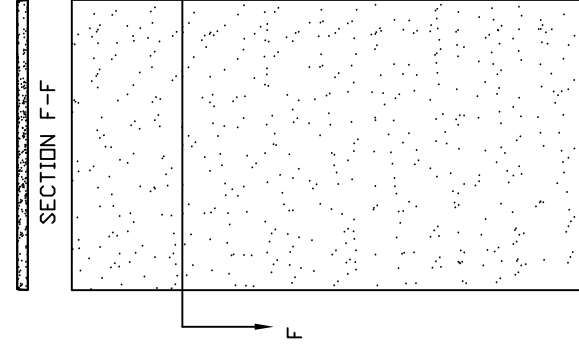
(C) STEEL STIFFENED



(D) HONEYCOMB
KRAFT PAPER. 1.2" CELL SIZE



(E) TEMPERATURE RISE CORE
MINERAL AND FIBER BOARD
DENSITY: 17 ± 1.5 LBS/CUFT



(F) EXPANDED POLYSTYRENE FOAM
BY ATLAS, DENSITY: 1.0 LB/FT³
OR POLYISOCYANURATE H200
BY ELFOAM. DENSITY: 2 LBS/FT³

AVAILABLE

TABLE 3.

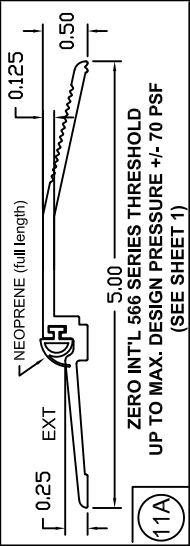
DOOR SERIES	CORE MATERIAL PER SHT.7
L	HONEYCOMB POLYSTYRENE POLYURETHANE
B	STEEL STIFFENED
SL/SZ	HONEYCOMB POLYSTYRENE POLYURETHANE
T	MINERAL FIBER
COMMERCIAL EMBOSSED PANEL	POLYSTYRENE HONEYCOMB

NOTES:

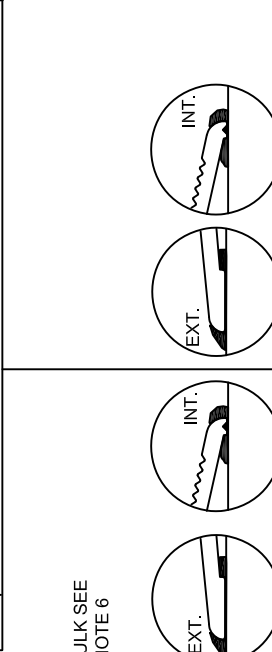
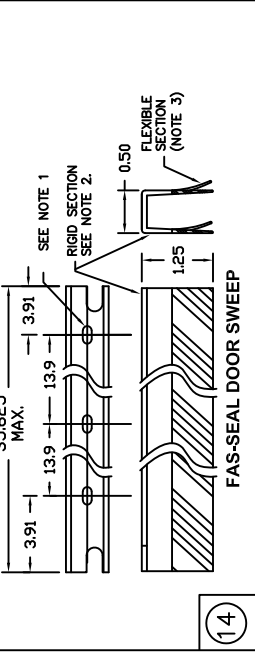
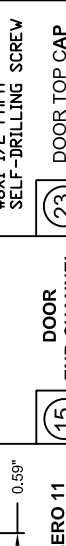
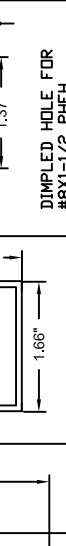
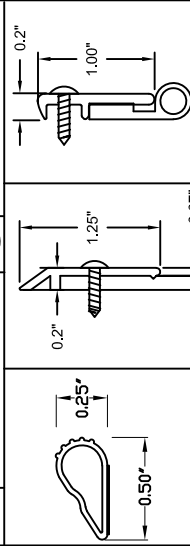
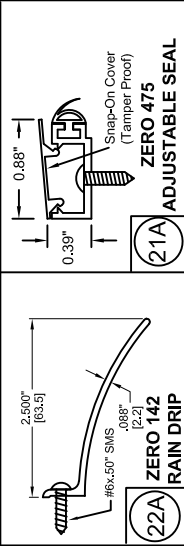
TABLE 5.1 OUTSWING WATER RATED PERIMETER SEAL HARDWARE - ZERO INT'L THRESHOLD 566

ITEM NUMBER	MODEL No./ DESCRIPTION	MFG.
11A	566 THRESHOLD	ZERO INT'L
14	FAS-SEAL SWEEP	STEELCRAFT
15	END CHANNEL	STEELCRAFT
13B	188S DOOR SEAL	ZERO INT'L
20A	139 DOOR SWEEP	ZERO INT'L
20B	328 DOOR SWEEP	ZERO INT'L
21A	475 ADJUSTABLE SEAL	ZERO INT'L
22A	142 RAIN DRIP	ZERO INT'L
22B	11 RAIN DRIP	ZERO INT'L
23	DOOR TOP CAP	STEELCRAFT

ZERO INT'L 566 THRESHOLD GASKETING SYSTEM
REQUIREMENTS FOR WATER INFILTRATION -
MAXIMUM DESIGN PRESSURE RATING 70PSF -
MAXIMUM DOOR SIZE 3'-0" X 7'-0"
(SEE ELEVATIONS SHEET 1)



ZERO INT'L 566 SERIES THRESHOLD
UP TO MAX. DESIGN PRESSURE +/- 70 PSF
(SEE SHEET 1)

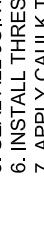
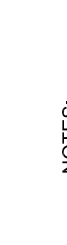
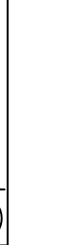
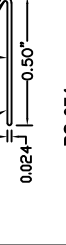
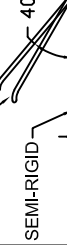
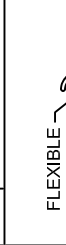
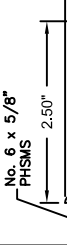
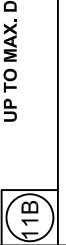
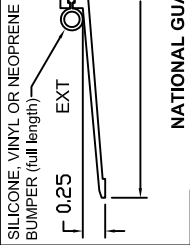


TYPICAL THRESHOLD SET INTO
BEAD OF CAULK SEE NOTE 6

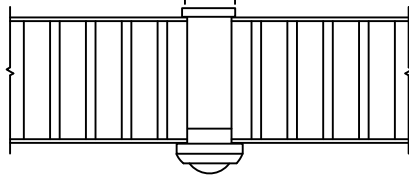
TABLE 5.2 OUTSWING WATER RATED PERIMETER SEAL HARDWARE-NGP

ITEM NUMBER	MODEL No./ DESCRIPTION	MFG.
11B	950 THRESHOLD	NGP
14	FAS-SEAL SWEEP	STEELCRAFT
15	END CHANNEL	STEELCRAFT
13A	PS074 DOOR SEAL	STEELCRAFT
19	202N DOOR SEAL	NGP
20C	200N DOOR SWEEP	NGP
21B	170N ADJUSTABLE SEAL	NGP
22C	16A RAIN DRIP	NGP
23	DOOR TOP CAP	STEELCRAFT

NGP 950 THRESHOLD GASKETING SYSTEM
REQUIREMENTS FOR WATER INFILTRATION -
MAXIMUM DESIGN PRESSURE RATING 70PSF -
MAXIMUM DOOR SIZE OF 3'-0" X 7'-0"
(SEE ELEVATIONS SHEET 1)



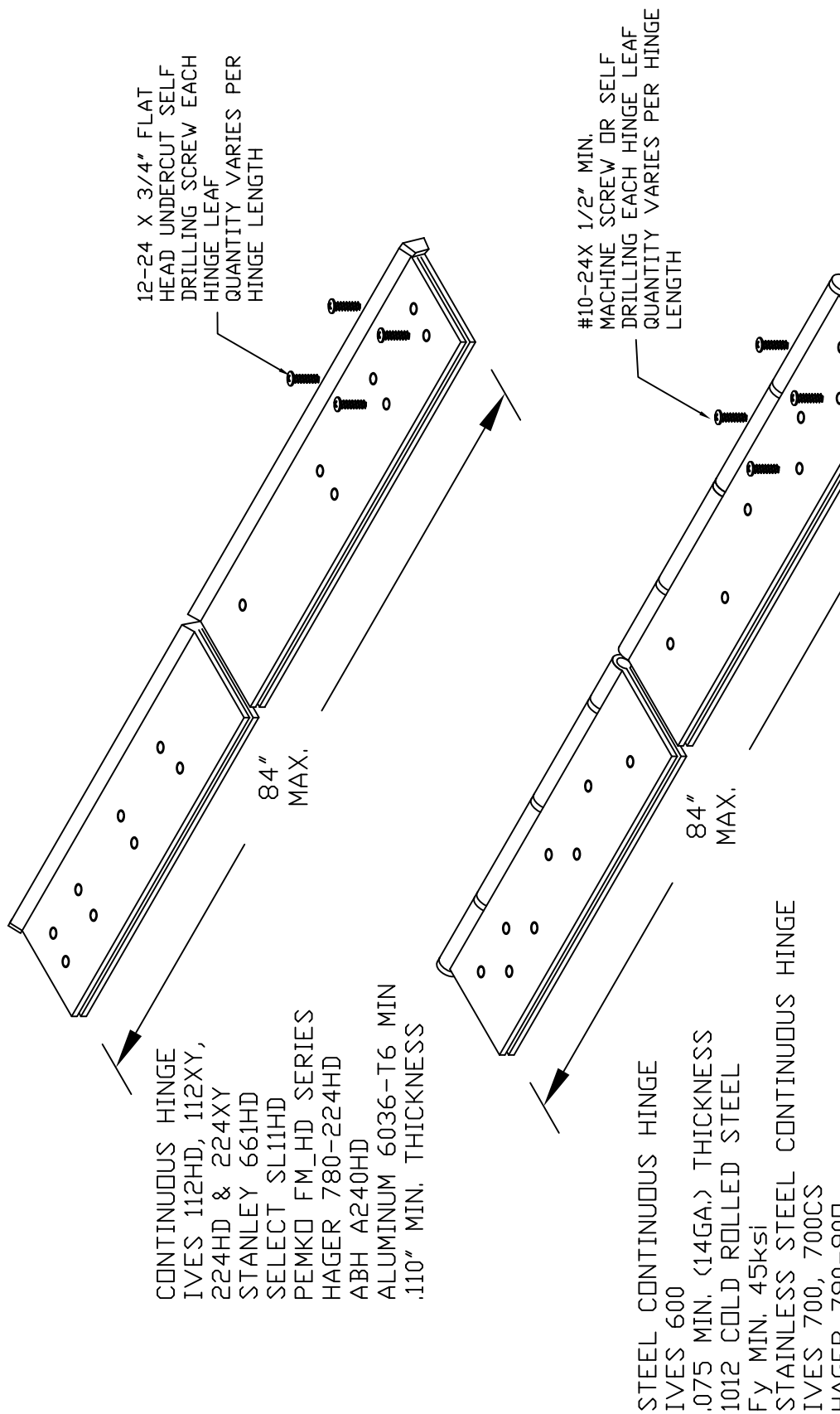
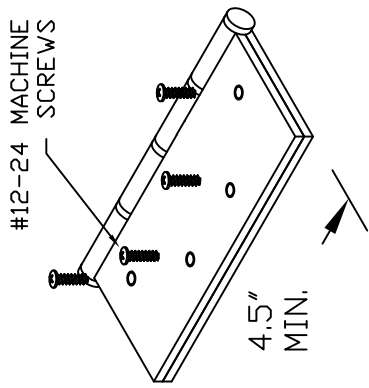
DETAIL 'G'
DOOR VIEWER
IN-DOOR PREP



Ø0.625" MAX.

AVAILABLE VIEWERS:
IVES U696, U697, 698,
U698, 700, U700
DEXTER 697, 698

STEEL BUTT HINGE
IVES 5BB1/3CB1
4.5" X 4.5" STD. WT. MIN.
.134" MIN. THICKNESS
Fy MIN. = 36ksi
STEEL BUTT HINGE
STANLEY FBB179/1900
HAGER BB1279
4.5" X 4.5" STD. WT. MIN.
.134" MIN. THICKNESS
Fy MIN. = 36ksi



12-24 X 3/4" FLAT
HEAD UNDERCUT SELF
DRILLING SCREW EACH
HINGE LEAF
QUANTITY VARIES PER
HINGE LENGTH

CONTINUOUS HINGE
IVES 112HD, 112XY,
224HD & 224XY
STANLEY 661HD
SELECT SL11HD
PEMKO FM_HD SERIES
HAGER 780-224HD
ABH A240HD
ALUMINUM 6036-T6 MIN
.110" MIN. THICKNESS

STEEL CONTINUOUS HINGE
IVES 600
.075 MIN. (14GA.) THICKNESS
1012 COLD ROLLED STEEL
Fy MIN. 45ksi
STAINLESS STEEL CONTINUOUS HINGE
IVES 700, 700CS
HAGER 780-000

#10-24X 1/2" MIN.
MACHINE SCREW OR SELF
DRILLING EACH HINGE LEAF
QUANTITY VARIES PER HINGE
LENGTH

84" MAX.

84" MAX.



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Certificate of Authorization: 29578

398 E. Dania Beach Blvd.
Suite 338
Dania Beach, FL 33004
954.399.8478 PH
954.744.4738 FX
contact@buildingdrops.com

Product Evaluation Report

of

Allegion-Schlage Lock Company, LLC.

Allegion-Schlage SZ/SL/L/CE/L/B/T Series

Single Flush Outswing/Inswing Commercial Steel Door

for

Florida Product Approval

FL# FL4613

Report No. 7228

Current Florida Building Code

Category:	Exterior Doors
Sub – Category:	Exterior Door Components
Product:	Allegion/Schlage SZ/SL/L/CE/L/B/T Series Single Flush Outswing/Inswing Commercial Steel Door
Door Material:	Varies, See Installation Instructions S05-012
Frame Material:	Varies, See Installation Instructions S05-012
Product Dimensions:	See Installation Instructions S05-012

Prepared for:

Allegion-Schlage Lock Company, LLC.
11819 N. Pennsylvania Street
Carmel, IN 46032

Prepared by:

Hermes F. Norero

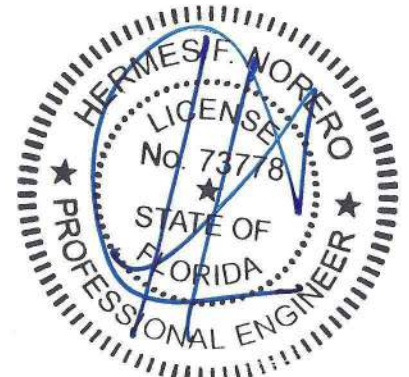
Florida Professional Engineer # 73778

Date: 02/11/2021

Contents:

Evaluation Report Pages 1 – 4

Digitally signed by Hermes F Norero
Reason: I am approving this document
Date: 2021.02.15 13:48:17 -05'00'



Hermes F. Norero, P.E.
Florida P.E. No. 73778



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Certificate of Authorization: 29578

FL#: **FL4613**

Date: 02/11/2021

Report No: 7228

Manufacturer: Allegion-Schlage Lock Company, LLC.

Product Category: Exterior Doors

Product Sub-Category: Exterior Door Components

Compliance Method: State Product Approval Rule (1)(d)

Product Name: Allegion-Schlage SZ/SL/L/CE/L/B/T Series Single Flush Outswing/Inswing Commercial Steel Door

Scope: This is a Product Evaluation Report issued by Hermes F. Norero, P.E. (FL # 73778) for **Allegion-Schlage Lock Company, LLC.** based on Method 1d of the State of Florida Product Approval, Department of Business and Professional Regulation - Florida Building Commission.

Hermes F. Norero, P.E. does not have nor will acquire financial interest in the company manufacturing or distributing the product or in any other entity involved in the approval process of the product named herein.

This product has been evaluated for use in locations adhering to the current Florida Building Code.

See Installation Instructions **S05-012**, signed and sealed by Hermes F. Norero, P.E. (FL # 73778) for specific use parameters.

Limits of Use:

1. This product has been evaluated and is in compliance with the current Florida Building Code, including the "High Velocity Hurricane Zone" (HVHZ).
2. Product anchors shall be as listed and spaced as shown on details. Anchor embedment into substrate material shall be beyond wall dressing or stucco.
3. When used in areas requiring wind borne debris protection this product complies with Chapter 16 of the Florida Building Code and **does not require** an impact resistant covering.
4. Site conditions that deviate from the details of Installation Instructions **S05-012** require further engineering analysis by a licensed engineer or registered architect.
5. See Installation Instructions **S05-012** for size and design pressure limitations.



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Certificate of Authorization: 29578

FL#: **FL4613**

Date: 02/11/2021

Report No: 7228

Quality Assurance: The manufacturer has demonstrated compliance of manufacture products in accordance with the Florida Building Code for manufacturing under a quality assurance program audited by an approved quality assurance entity through **Intertek Testing Services NA, Inc. - QA Entity** (FBC Organization #: QUA1673).

Performance Standards: The product described herein has been tested per:

- TAS 201-94
- TAS 202-94
- TAS 203-94
- ASTM E283-04(12)
- ASTM E330-14
- ASTM E331-00(09)

Referenced Data:

1. Product Testing performed by **Certified Testing Laboratories**
(FBC Organization # TST1577)
Report #: CTLA-2037, Report Date: 06/29/03
Report #: CTLA-3045W, Report Date: 02/16/15
Report #: CTLA-992W, Report Date: 05/28/03
Report #: CTLA-3064W-4, Report Date: 01/08/16
Report #: CTLA-3064W-7, Report Date: 01/08/16
Report #: CTLA-3064W-12, Report Date: 01/08/16
Report #: CTLA-3064W-14, Report Date: 01/08/16
Signed and sealed by Ramesh Patel, FL P.E. No 20224
2. Product Testing performed by **Element Materials Technology**
(FBC Organization # TST2613)
Report #: ESP011623P, Report Date: 03/09/08
All reports signed and sealed by Jason Sheen, FL P.E. No 67814
3. Product Testing performed by **Intertek**
(FBC Organization # TST1527)
Report #: G1447.01-450-18, Report Date: 02/07/17
All reports signed and sealed by Jason Sheen, FL P.E. No 67814
4. Quality Assurance Entity:
Intertek Testing Services NA Inc. – QA Entity
(FBC Organization #: QUA1673)



BUILDING DROPS

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Certificate of Authorization: 29578

FL#: FL4613

Date: 02/11/2021

Report No: 7228

Installation: Refer to Installation Instructions (**S05-012**) for more details of the installation requirements.

Design Pressure: Refer to Installation Instructions (**S05-012**) for design pressures dependent on hardware type, configuration, and size of units.

Equivalence of Test Standards:

Various test standards have been evaluated for differences in test methodology, if any, between tested editions of the test standards listed below and those editions referenced in the Current Florida Building Code. The manufacturer has tested their products to the following test standard edition(s):

- 1) ASTM E283-04
- 2) ASTM E330-02
- 3) ASTM E331-00

Chapter 35 of the Current Florida Building Code references the following editions of the above mentioned test standards:

- 1) ASTM E283-04(12)
- 2) ASTM E330-14
- 3) ASTM E331-00(09)

After review of the above-mentioned referenced standards and editions, it has been found that no significant technical changes have been made to the test standards that would affect the results. All referenced standards have been found to be equivalent.

**SECTION 08 1423
LAMINATE-FACED FLUSH WOOD DOORS**

PART 1 -GENERAL

1.1 SECTION INCLUDES

- A. Flush wood doors with high pressure decorative laminate faces.

1.2 RELATED REQUIREMENTS

- A. Section 08 1113 - Hollow Metal Doors and Frames.
- B. Section 08 7100 - Door Hardware.
- C. Section 08 8000 - Glazing.
- D. Section 09 9000 - Painting: Painting of exposed surfaces of primed steel astragals.

1.3 REFERENCE STANDARDS

- A. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.4 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: Not required.
- C. Shop Drawings: Show the following minimum information. Use the same reference numbers for openings as those indicated on the Drawings. Shop fabrication work tickets are not acceptable submittals.
 - 1. Door elevations with dimensions.
 - 2. Hand and swing.
 - 3. Fire ratings.
 - 4. Stile and rail construction and reinforcement, mortises and internal blocking for hardware in non-rated and fire-rated doors, and positive pressure provisions for fire-rated doors.
 - 5. Location and type of provisions in doors for scheduled hardware attachment.
 - 6. Thickness and type of laminated plastic cladding and crossbands.
 - 7. Type of finish for all door edges.
 - 8. Locations and dimensions of cut-outs, holes and mortises.
 - 9. Type of glazing stops.
 - 10. Doors with thresholds, undercut bottom edges and other special features.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit letter stating that products will be provided per Owner's Bulk Purchasing List.
- B. Specimen warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Warranty, executed in Owner's name.
- B. Manufacturer's maintenance recommendations.

1.7 REQUIREMENTS FOR RATED OPENINGS

- A. Comply with requirements of the code having jurisdiction for fire rated doors for the rating class indicated.

- B. Ensure metal labels, bearing the name of the labeling agency, are shipped on rated doors, placed between the two upper hinge locations. Paper or plastic labels are not acceptable.
- C. Doors shipped without factory affixed labels will be rejected.
- D. Ensure that astragals are shipped on rated doors if the manufacturer's approved labeling procedures require factory installation.

1.8 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Manufacturer that is certified for chain of custody by an FSC-accredited certification body and a certified participant in AWI's Quality Certification Program.
- C. Source Limitations: Obtain doors from single manufacturer

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver items to the site and handle, store and protect under provisions of Section 01 6000.
- B. Have doors individually packaged at the factory sealed with heat shrunk plastic, and marked on the top and bottom rails for individual door openings indicated on the Drawings.
- C. Deliver doors after the building is enclosed, dry, heated and adequately ventilated. Do not receive or store doors in damp areas. Do not drag the doors on the ground, floor or across one another.
- D. Store doors flat on a level surface. Do not lean doors against vertical surfaces. Break sealed plastic packaging to permit ventilation. Do not subject doors to extreme conditions or changes in heat, dryness or humidity (humidity to be no less than 30% and no more than 60%).
- E. Do not lean doors against vertical surfaces or store doors on edge. Do not store other materials on top of stacked doors. Do not walk on stacked doors.
- F. Handle doors with clean gloves. Do not drag doors across one another or across other surfaces.

1.10 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Warranty: Replace, including rehanging and refinishing, at no cost to the Owner, doors exhibiting defects in materials and workmanship, including warp (bow, cup, or twist) or delamination, the life of the installation.

PART 2 -PRODUCTS

2.1 MATERIALS

- A. Doors - General: "Perma-Clad" laminated plastic clad doors by VT Industries, Inc. (vtindustries.com) as specified below for the application:
 - 1. Particleboard Cores: Particleboard (FSC certified Particleboard), ANSI A208.1, grade 1-LD-2, with the following percentage of door construction weight, composed of pre-consumer recycled material:
 - a. Other doors: 70%.
 - 2. Mineral Board Cores: Noncombustible mineral board, 30.8-34.7 lbs./ft³, containing no asbestos: 70%.
 - 3. Crossbanding: Rotary cut, single ply, clear grade hardwood, 1/16 inch thick before sanding.
 - 4. Laminated Plastic: NEMA LD3, Type 1 general purpose, 1/16 inch thick.
 - 5. Stiles and Rails: Suitable for hanging on full mortise butt hinges. "Firestop" stiles and rails will not be acceptable for rated doors.

- a. Non-Rated, 20-Minute and 45-Minute Doors: Structural composite lumber (SCL).
 - b. 60 and 90 Minute Label Doors: Reinforced "Triple-Ply" stile for suitable hanging on full mortise butt hinges.
 - c. All Label Doors: Include internal intumescent strip on stiles and top rail to meet positive pressure requirements.
 6. Edge Bands: Laminated plastic matching faces for stiles. If tops of any doors are visible, also band the top rail.
 7. Lite Moldings: Moldings wide enough to completely cover exposed edges of veneer and crossbanding when seated against the glass pane.
 - a. Non-Rated Doors: "VT1" flush rectangular poplar beads, unless noted otherwise.
 - b. Rated Doors: "VT1F" veneer wrapped moldings, using poplar veneer unless noted otherwise. Other veneer wrapped or solid wood moldings approved in the manufacturer's labeling procedures will be considered. Include concealed metal glazing clips where required by the manufacturer's labeling procedures.
 8. Substitutions: See substitutions per the Owner's Bulk Purchasing Vendor List in Document 002150.
- B. Non-Rated Doors:
1. Other Doors: No. 404-3 with laminated particleboard core of 28-30 lbs/cu ft density.
- C. Rated Doors:
1. 20-minute Label Doors - non lead-lined: No. 4P04-3.
 2. 20-minute Label Doors - lead lined: No. 1P15-3.
 3. 20-minute Acoustical Core Doors: No. 1P50H, STC 45.
 4. 45 minute Label Doors: No. 1P45-3 with stiles for using mortise hinges, and meeting U.L. 250 deg F temperature rise criteria.
 5. 60 and 90 Minute Label Doors: No. 1P11-3 with stiles for using mortise hinges.
- D. All Doors: See drawings for locations and additional requirements.
1. Quality Level: Premium Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
 2. High Pressure Decorative Laminate Faced Doors: 5-ply unless otherwise indicated.
- E. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
1. Provide solid core doors at all locations.
 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with International Building Code ("positive pressure"); UL or WH (ITS) labeled without any visible seals when door is open.
 3. Smoke and Draft Control Doors 3.0 cfm per sq ft of door opening at 0.10 inch w.g. pressure at both ambient and elevated temperatures; with "S" label; gasketing is specified in Section 087100.
 4. High Pressure Decorative Laminate Finish where indicated on drawings.

2.2 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated above.
- B. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.3 DOOR FACINGS

- A. High Pressure Decorative Laminate Facing for Fire Doors: NEMA LD 3, SGF; colors as indicated; high gloss finish.
- B. High Pressure Decorative Laminate Facing for Non-Fire-Rated Doors: NEMA LD 3, HGS; colors as indicated; high gloss finish.
- C. Cross Banding Behind High Pressure Laminate Finish: 1 ply; of Rotary cut, single ply, clear grade hardwood, 1/16 inch thick before sanding.

- D. Facing Adhesive: Type I - waterproof.

2.4 FABRICATION

- A. Fabricate doors to have faces, crossbanding, stiles and cores to match the specified manufacturer's construction for applicable type of doors. For all labeled doors, include internal intumescent strip to meet positive pressure label requirements.
- B. Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
- C. Construction: 5 ply with stiles and rails are bonded to core, then entire unit abrasive planed before crossbanding and veneering. Lead-lined doors similar, but with a ply of lead lining on each side of core.
- D. Cores: Particleboard for non-rated and 20-minute doors, and mineral core for all doors with a fire rating of greater than 20 minutes.
- E. Blocking: Provide wood blocking as needed to eliminate through-bolting hardware, but no less than the following:
1. Doors Indicated to Have Closers: 5-inch top-rail blocking.
 2. Doors Indicated to Have Exit Devices: 5-inch mid-rail blocking.
- F. Edge Bands: Apply to conceal crossbanding, Intumescent strips and lead lining, applicable, as well as the transition from the face laminate to the edge band.
- G. Bevel strike and hinge stiles 1/8 inch in 2 inches.
- H. Astragals:
1. Other Labeled Pairs of Doors: Provide astragals complying with the manufacturer's approved labeling procedures for the rating class indicated.
 2. Finish: Exposed surfaces to be clear anodized if aluminum, and factory primed if steel.
- I. Make cut-outs for vision panels at the factory to be of sizes and locations indicated. Allow 6 inches minimum at door edge. Have rated doors with vision panels factory glazed with fire rated glass specified in Section 088000 and with veneered glazing beads also installed at the factory. Other doors may also be factory glazed - Contractor's option. Miter stops to form hairline joints.
- J. Hardware Preparation: Make cut-outs at the factory from the hardware manufacturer's templates and approved shop drawings. Pilot drill holes for hardware attachment. Pre-machine doors within industry tolerances, and within the following:
1. Lock Front Preparation Cutouts: +1/32 to -1/64 inch.
 2. Other Hardware Locations: +1/32 inch.
- K. Prefitting: Factory prefit doors for frame opening dimensions identified on shop drawings. Perform any necessary factory trimming before any face or edge laminates are applied. For labeled doors, perform trimming in accordance with labeling procedures. Fit doors for the following clearances:
1. Heads and Jambs: 1/8 inch.
 2. Floor Clearance - openings with carpet divider: 1/4 inch.
 3. Floor Clearance - all other openings: 1/2 inch maximum.
- L. Seal top and bottom rails of doors and wood particleboard exposed by cut-outs with high quality preservative
- M. Affix metal fire rating labels and metal STC labels to doors at the factory.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Verify that opening sizes and tolerances are acceptable.

- B. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.
- C. Do not attempt to trim doors on site. Return doors to the manufacturer, or a facility designated by the manufacturer, to have trimming done in accordance with the manufacturer's standard procedures, and in accordance with the manufacturer's approved labeling procedures if doors are rated. Ensure labels, and astragals if required, are installed on rated doors when the doors are returned to the Project site. Replace doors if:
 - 1. After trimming operations, evidence of trimming exists.
 - 2. Trimming operations will require new machining for lockset/latchset placement.
 - 3. Trimming cannot be performed within the guidelines and requirements of the manufacturer's approved labeling procedures.
 - 4. Doors are returned to the site without affixed labels.
 - 5. Doors are returned to the site without affixed astragals if required to be factory installed per the manufacturer's approved labeling procedures.

3.2 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard. Pilot drill holes for hardware attachment.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Coordinate installation with installation of frames specified in Section 081113 and hardware specified in Section 087100.
- D. If vision lites for non-rated doors are not factory installed, coordinate installation of vision lites. Install veneered stops with corners mitered to form hairline joints.
- E. Installation tolerances:
 - 1. Maximum Diagonal Distortion (Warp): 1/16 inch measured with a straight edge or taught string, corner to corner.
 - 2. Maximum Vertical Distortion (Bow): 1/16 inch measured with a straight edge or taught string, top to bottom.
 - 3. Maximum Width Distortion (Cup): 1/16 inch measured with a straight edge or taught string, edge to edge.
- F. Replace doors which are damaged during installation, or as a result of subsequent construction activities.

3.3 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Ensure doors are free from:
 - 1. Hinge bound conditions, striking or binding.
 - 2. Rattling when in closed position.
- C. If any doors cannot be adjusted to specified conditions, replace such doors and install to meet specified conditions.
- D. If any doors are damaged during attempts at adjustment, replace such doors and install to meet specified conditions.

3.4 WASTE MANAGEMENT

- A. Separate and recycle waste materials in accordance with the Waste Management Plan specified in Section 017419.
- B. Fold up metal banding - flatten and place in designated area for metal recycling.
- C. Separate corrugated packaging and place in designated area for paper product recycling.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 08 3100
ACCESS DOORS AND PANELS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted access units.

1.2 RELATED REQUIREMENTS

- A. Section 09 9123 - Interior Painting: Field paint finish.
- B. Section 23 3300 - Air Duct Accessories: Access doors in ductwork.

1.3 REFERENCE STANDARDS

- A. UL (FRD) - Fire Resistance Directory Current Edition.

1.4 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- D. Manufacturer's Installation Instructions: Indicate installation requirements.
- E. Manufacturer's Qualification Statement.
- F. Project Record Documents: Record actual locations of each access unit.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.1 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Wall-Mounted Units:
 - 1. Panel Material: Steel.
 - 2. Size: 12 by 12 inches minimum.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
- B. Wall-Mounted Units in Wet Areas:
 - 1. Panel Material: Stainless steel.
 - 2. Size: 12 by 12 inches minimum.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.

- C. Fire-Rated Wall-Mounted Units:
1. Wall Fire-Rating: As indicated on drawings.
 2. Panel Material: Steel.
 3. Size: 12 by 12 inches minimum.
 4. Door/Panel: Insulated double-surface panel, cam lock and no handle.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.3 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Infill panels of glass.
- C. Aluminum doors and frames.
- D. Weatherstripping.
- E. Door hardware.

1.2 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

1.3 REFERENCE STANDARDS

- A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections 2009.
- D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- G. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2019.
- H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014 (Reapproved 2021).
- I. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).
- J. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.

- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
 - 1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.
- D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- E. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- H. Designer's Qualification Statement.
- I. Manufacturer's Qualification Statement.
- J. Installer's Qualification Statement.
- K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
 - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
 - a. Insulating Glass Certification Council (IGCC).
 - b. Safety Glazing Certification Council (SGCC).
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
 - 1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
 - a. North American Contractor Certification (NACC) for glazing contractors.
 - b. Equivalent independent third-party ANSI accredited certification.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.8 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.9 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.1 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

- A. Center-Set Style, Wind-Borne-Debris Resistance Tested:
 - 1. Basis of Design: YKK AP America Inc. Series YHS 50 FI storefront, outside glazed.
- B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
 - 1. Kawneer North America: www.kawneer.com/#sle.
 - 2. Oldcastle BuildingEnvelope: www.oldcastlebe.com/#sle.
- C. Substitutions: See Section 01 6000 - Product Requirements.
 - 1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.2 BASIS OF DESIGN -- SWINGING DOORS

- A. Wind-Borne-Debris Resistance Tested:
 - 1. Basis of Design: YKK AP America Inc., Series 50 HL.
- B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
 - 1. Kawneer North America: www.kawneer.com/#sle.
 - 2. Oldcastle BuildingEnvelope: www.oldcastlebe.com/#sle.
- C. Substitutions: See Section 01 6000 - Product Requirements.

2.3 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Unitized, shop assembly.
 - 2. Glazing Rabbet: For 1 5/16 inch insulating glazing.
 - 3. Glazing Position: Centered (front to back).
 - 4. Finish: Class I natural anodized,
 - a. Factory finish all surfaces that will be exposed in completed assemblies.
 - b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
 - c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
 - 5. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 - 7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - 8. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 - 9. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.

10. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 11. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel, and heel bead of glazing compound.
- B. Performance Requirements
1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Design Wind Loads: Comply with requirements of applicable code.
 2. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, having Florida Building Code FLA (PAD) approval for Large and Small Missile impact and pressure cycling at design wind pressure.
 3. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
 4. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.
 5. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
 6. Overall U-value Including Glazing: 0.50 Btu/(hr sq ft deg F), maximum.

2.4 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
1. Glazing Stops: Flush.
 2. Cross-Section: As required by Florida Product Approval or NOA number.
- B. Glazing: See Section 08 8000.
- C. Swing Doors: Glazed aluminum.
1. Cross-Section: As required by Florida Product Approval or NOA number.
 2. Finish: Same as storefront.

2.5 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Fasteners: Stainless steel.
- D. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness; finish to match framing members.
- E. Concealed Flashings: Stainless steel, 26 gauge, 0.0187 inch minimum thickness.
- F. Concealed Flashings: Sheet aluminum, 26 gauge, 0.017 inch minimum thickness.
- G. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.
- H. Sealant for Setting Thresholds: Non-curing butyl type.
- I. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- J. Glazing Accessories: See Section 08 8000.
- K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.6 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
- B. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.7 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: Storefront manufacturer's standard type to suit application.
 - 1. For each door, include pivots, exit device, narrow stile handle latch, and closer.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.
- F. Pivots: Center type; top and bottom.
- G. Exit Devices: Panic type.
- H. Door Closers: Concealed overhead.
- I. Handle Latch: Lever type.
- J. Locks: Electrified mortise type. Connect to card reader.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.2 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

- I. Set thresholds in bed of sealant and secure.
- J. Install hardware using templates provided.
- K. Install glass using glazing method required to achieve performance criteria; see Section 08 8000.
- L. Install applied muntin grid assembly in accordance with manufacturer's instructions.
- M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.3 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 FIELD QUALITY CONTROL

- A. Provide services of storefront manufacturer's field representative to observe for proper installation of system and submit report.
- B. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.5 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.6 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.
- C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

3.7 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

YKK AP AMERICA INC.

SERIES YHS 50 FI STOREFRONT

OUTSIDE GLAZED - WIND ZONE 3 IMPACT

INSTALLATION NOTES:

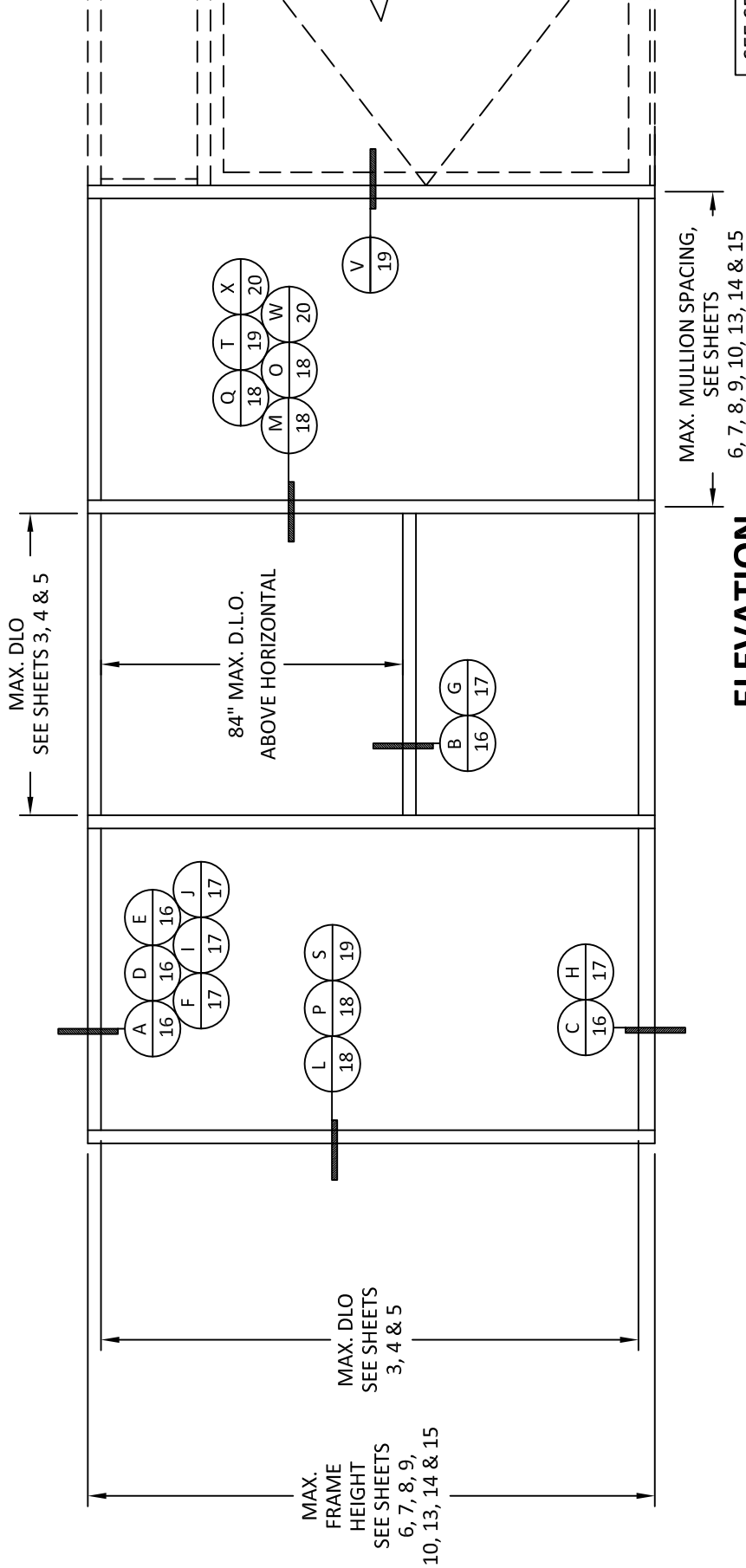
- SEE SHEET 16 & 17 FOR ANCHOR TYPE REQUIREMENTS, MINIMUM EMBEDMENTS, AND MINIMUM EDGE DISTANCES. ALL ANCHOR REQUIREMENTS MUST BE ADHERED TO. ANY DEVIATIONS FROM ANCHOR REQUIREMENTS REQUIRES SEPARATE EVALUATION AND APPROVAL.
- ONE (1) INSTALLATION ANCHOR IS REQUIRED AT EACH ANCHOR LOCATION SHOWN.
- THE NUMBER OF INSTALLATION ANCHORS DEPICTED IS THE MINIMUM NUMBER OF ANCHORS TO BE USED FOR PRODUCT INSTALLATION.
- INSTALL INDIVIDUAL INSTALLATION ANCHORS WITHIN A TOLERANCE OF ±1/2 INCH OF THE DEPICTED LOCATION IN THE ANCHOR LAYOUT DETAIL (I.E., WITHOUT CONSIDERATION OF TOLERANCES). TOLERANCES ARE NOT CUMULATIVE FROM ONE INSTALLATION ANCHOR TO THE NEXT.
- SHIM AS REQUIRED AT EACH INSTALLATION ANCHOR WITH LOAD BEARING SHIM(S). MAXIMUM ALLOWABLE SHIM STACK TO BE 3/8 INCH. SHIM WHERE SPACE OF 1/16 INCH OR GREATER OCCURS. SHIM(S) SHALL BE CONSTRUCTED OF HIGH DENSITY PLASTIC OR BETTER.
- MINIMUM EMBEDMENT AND EDGE DISTANCE EXCLUDE WALL FINISHES, INCLUDING BUT NOT LIMITED TO STUCCO, FOAM, BRICK VENEER, AND SIDING.
- INSTALLATION ANCHORS AND ASSOCIATED HARDWARE MUST BE MADE OF CORROSION RESISTANT MATERIAL OR HAVE A CORROSION RESISTANT COATING.
- FOR HOLLOW BLOCK AND GROUT FILLED BLOCK, DO NOT INSTALL INSTALLATION ANCHORS INTO MORTAR JOINTS. EDGE DISTANCE IS MEASURED FROM FREE EDGE OF BLOCK OR EDGE OF MORTAR JOINT INTO FACE SHELL OF BLOCK.
- INSTALLATION ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND ANCHORS SHALL NOT BE USED IN SUBSTRATES WITH STRENGTHS LESS THAN THE MINIMUM STRENGTH SPECIFIED BY THE ANCHOR MANUFACTURER.
- INSTALLATION ANCHOR CAPACITIES FOR PRODUCTS HEREIN ARE BASED ON SUBSTRATE MATERIALS WITH THE FOLLOWING

GENERAL NOTES:

- THE PRODUCT SHOWN HEREIN IS DESIGNED AND MANUFACTURED TO COMPLY WITH THE CURRENT FLORIDA BUILDING CODE (FBC), EXCLUDING HVHZ AND HAS BEEN EVALUATED ACCORDING TO THE FOLLOWING:
 - TAS 201-94
 - TAS 202-94
 - TAS 203-94
 - AAMA 501-05
 - ASTM E1886-05
 - ASTM E1996-06
- ADEQUACY OF THE EXISTING STRUCTURAL CONCRETE/MASONRY, 2X FRAMING AND METAL STUD FRAMING AS A MAIN WIND FORCE RESISTING SYSTEM CAPABLE OF WITHSTANDING AND TRANSFERRING APPLIED PRODUCT LOADS TO THE FOUNDATION IS THE RESPONSIBILITY OF THE ENGINEER OR ARCHITECT OF RECORD FOR THE PROJECT OF INSTALLATION.
- 1X AND 2X BUCKS (WHEN USED) SHALL BE DESIGNED AND ANCHORED TO PROPERLY TRANSFER ALL LOADS TO THE STRUCTURE. BUCK DESIGN AND INSTALLATION IS THE RESPONSIBILITY OF THE ENGINEER OR ARCHITECT OF RECORD FOR THE PROJECT OF INSTALLATION.
- THE INSTALLATION DETAILS DESCRIBED HEREIN ARE GENERIC AND MAY NOT REFLECT ACTUAL CONDITIONS FOR A SPECIFIC SITE. IF SITE CONDITIONS CAUSE INSTALLATION TO DEVIATE FROM THE REQUIREMENTS DETAILED HEREIN, A LICENSED ENGINEER OR ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS FOR USE WITH THIS DOCUMENT.
- APPROVED IMPACT PROTECTIVE SYSTEM **IS NOT REQUIRED** ON THIS PRODUCT IN AREAS REQUIRING IMPACT RESISTANCE IN

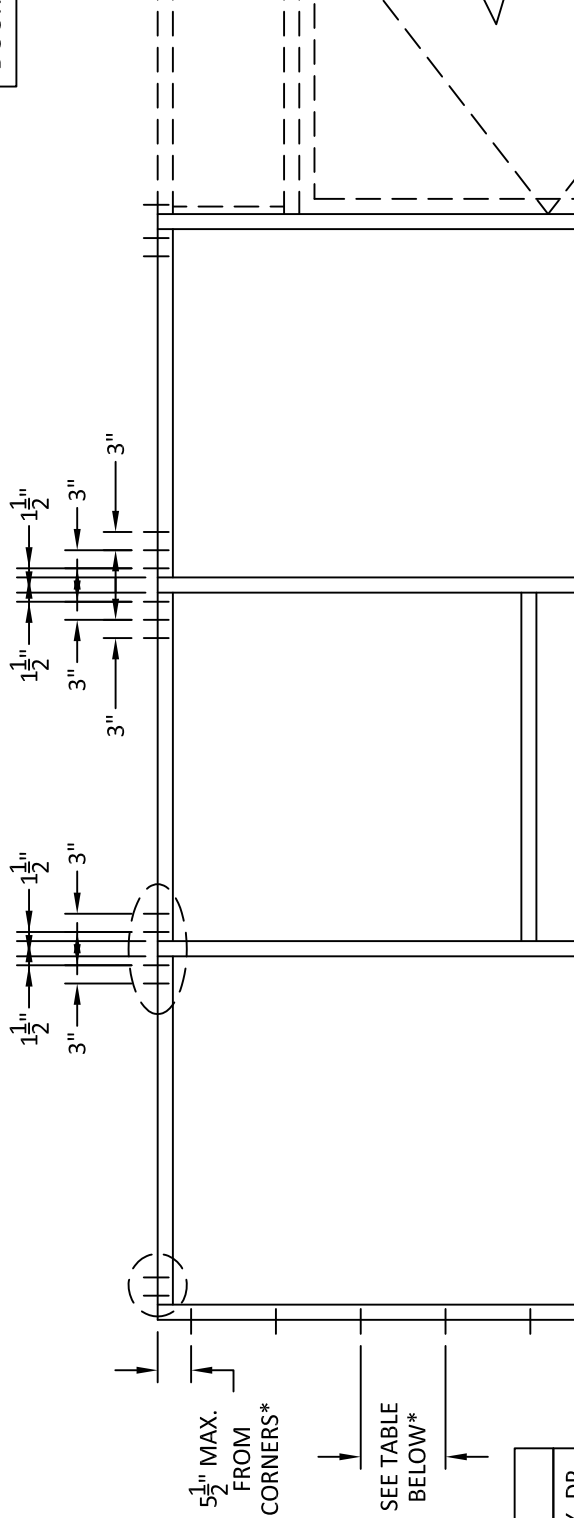
SHEET	REVISION
1	A
2	-
3	B
4	C
5	B
6	-
7	-
8	A
9	-
10	-
11	-
12	-
13	-
14	-
15	-
16	B
17	A
18	A
19	-
20	-
21	-
22	-

INSTRUCTIONS FOR USE:



ELEVATION

TYPICAL YHS 50 FI STOREFRONT

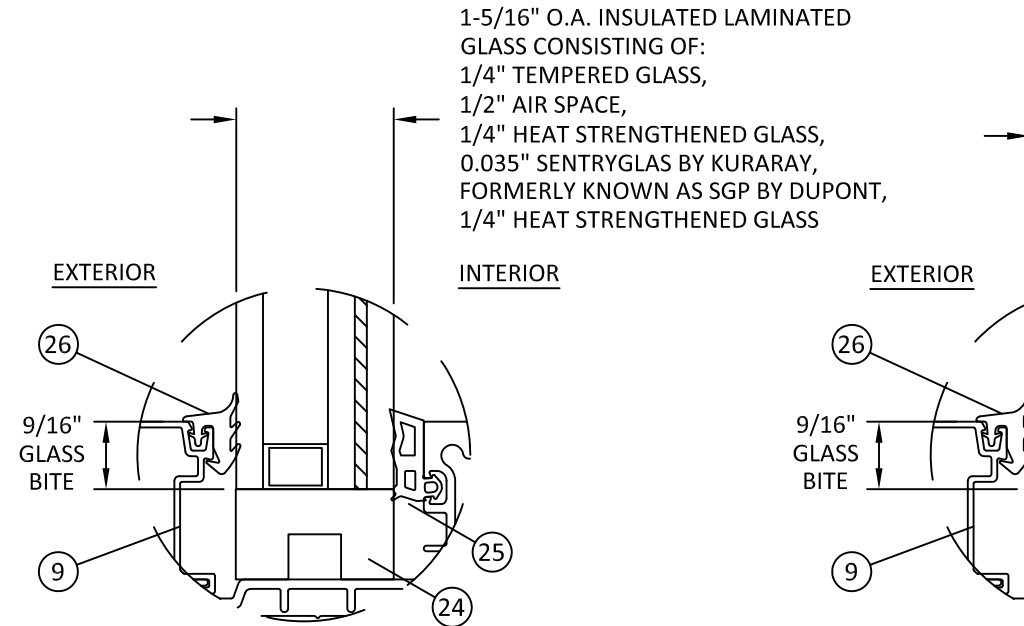


JAMB ANCHOR SPACING*		
ANCHOR TYPE	MAX. SPACING	MAX. DP

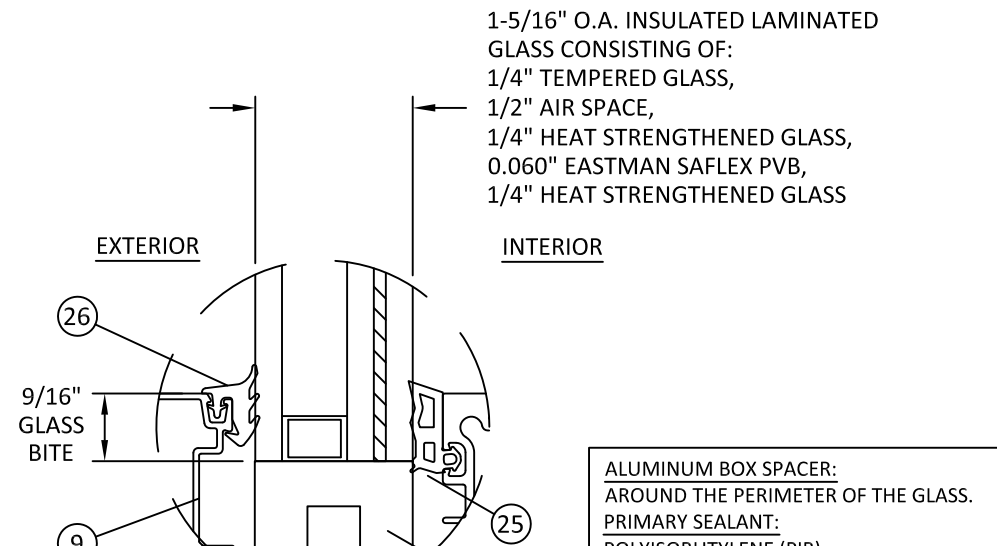
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DAYLIGHT OPENING (IN)		GLASS TYPES I OR J		GLASS TYPE K	DAYLIGHT OPENING (IN)		GLASS TYPES I OR J		GLASS TYPE K
DLO WIDTH	DLO HEIGHT	EXT. (+)	INT. (-)	EXT. (+) INT. (-)	DLO WIDTH	DLO HEIGHT	EXT. (+)	INT. (-)	EXT. (+) INT. (-)
27.5	54.375	70.0	90.0	70.0	27.5	90.375	70.0	90.0	70.0
33.5		70.0	90.0	70.0	33.5		70.0	90.0	70.0
39.5		70.0	90.0	70.0	39.5		70.0	90.0	70.0
45.5		70.0	90.0	70.0	45.5		70.0	90.0	70.0
51.5		70.0	90.0	70.0	51.5		70.0	90.0	70.0
57.5		70.0	90.0	70.0	57.5		70.0	90.0	70.0
63.5		70.0	90.0	70.0	63.5		63.4	81.5	63.4
69.5	60.375	70.0	90.0	68.4	69.5	96.375	57.9	74.5	47.2
27.5		70.0	90.0	70.0	27.5		70.0	90.0	70.0
33.5		70.0	90.0	70.0	33.5		70.0	90.0	70.0
39.5		70.0	90.0	70.0	39.5		70.0	90.0	70.0
45.5		70.0	90.0	70.0	45.5		70.0	90.0	70.0
51.5		70.0	90.0	70.0	51.5		70.0	90.0	70.0
57.5		70.0	90.0	70.0	57.5		70.0	90.0	70.0
63.5	66.375	70.0	90.0	70.0	63.5		63.4	81.5	51.7
69.5		70.0	90.0	70.0	66.5	102.375	60.5	77.8	49.4
27.5		70.0	90.0	70.0	27.5		70.0	90.0	70.0
33.5		70.0	90.0	70.0	33.5		70.0	90.0	70.0
39.5		70.0	90.0	70.0	39.5		70.0	90.0	70.0
45.5		70.0	90.0	70.0	45.5		70.0	90.0	70.0
51.5		70.0	90.0	70.0	51.5		70.0	90.0	70.0
57.5	72.375	70.0	90.0	70.0	57.5		70.0	90.0	70.0
63.5		63.4	81.5	63.4	63.5	108.375	63.4	81.5	51.7
69.5		63.5	81.6	63.5	27.5		70.0	90.0	70.0
27.5		70.0	90.0	70.0	33.5		70.0	90.0	70.0
33.5		70.0	90.0	70.0	39.5		70.0	90.0	70.0
39.5		70.0	90.0	70.0	45.5		70.0	90.0	70.0
45.5		70.0	90.0	70.0	51.5		70.0	90.0	70.0
51.5	78.375	70.0	90.0	70.0	57.5		70.0	90.0	57.1
57.5		70.0	90.0	70.0	60.5	114.375	66.5	85.5	54.3
63.5		63.4	81.5	63.4	27.5		70.0	90.0	70.0
69.5		57.9	74.5	57.9	33.5		70.0	90.0	70.0
27.5		70.0	90.0	70.0	39.5		70.0	90.0	70.0
33.5		70.0	90.0	70.0	45.5		70.0	90.0	70.0
39.5		70.0	90.0	70.0	51.5		70.0	90.0	57.1
45.5	84.375	70.0	90.0	70.0	57.5		70.0	90.0	57.1
51.5		70.0	90.0	70.0	27.5	120.375	70.0	90.0	70.0
57.5		70.0	90.0	70.0	33.5		70.0	90.0	70.0
63.5		63.4	81.5	63.4	38.5		70.0	90.0	70.0
69.5		57.9	74.5	57.9	27.5		70.0	90.0	70.0
27.5		70.0	90.0	70.0	33.5		70.0	90.0	70.0
33.5		70.0	90.0	70.0	38.5		70.0	90.0	70.0

GLASS TYPES

SMALL MISSILE IMPACT ONLY



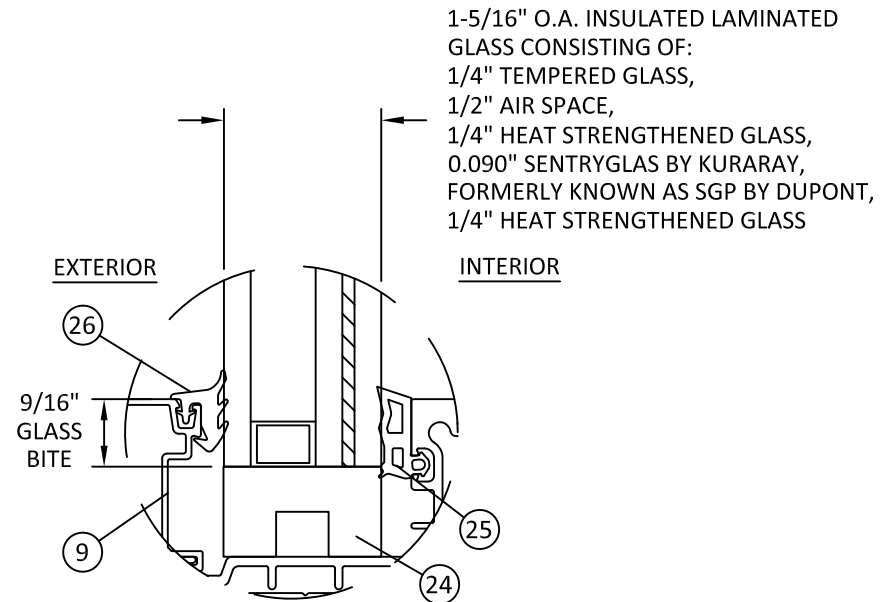
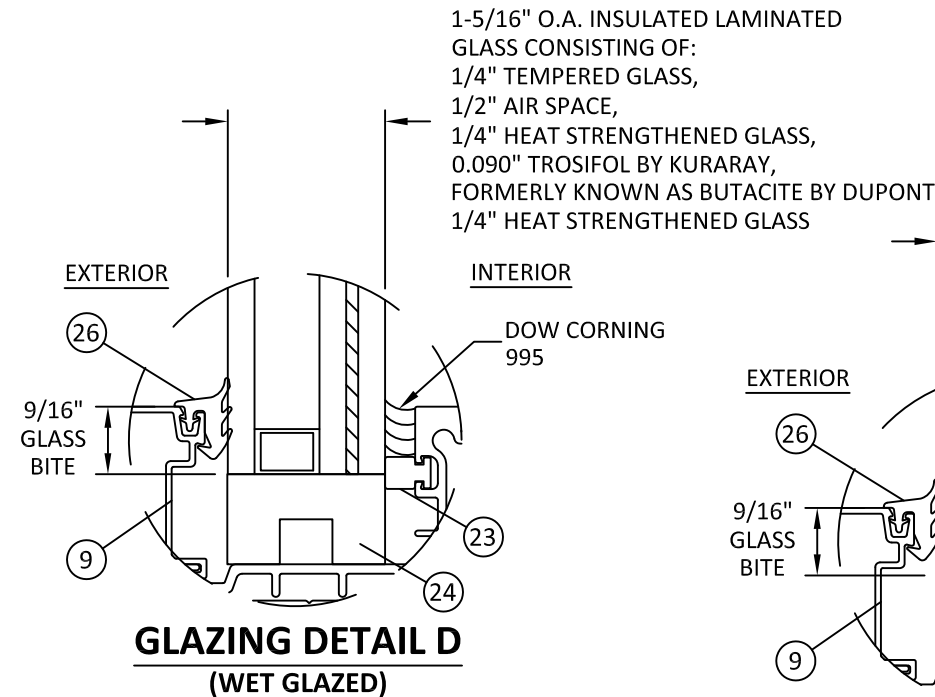
GLAZING DETAIL I
(DRY GLAZED)



GLASS TYPES

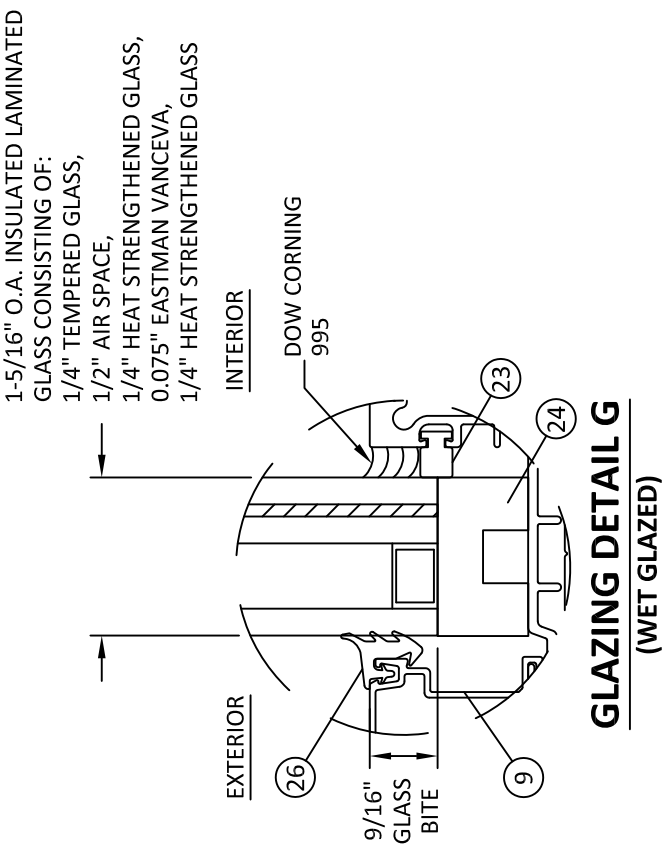
LARGE & SMALL MISSILE IMPACT

GLASS LOAD CAPACITY (PSF)						GLASS LOAD CAPACITY (PSF)					
DAYLIGHT OPENING (IN)		GLASS TYPES D, E OR I		GLASS TYPE F		DAYLIGHT OPENING (IN)		GLASS TYPES D, E OR I		GLASS TYPE F	
DLO WIDTH	DLO HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)	INT. (-)	EXT. (+) INT. (-)	DLO WIDTH	DLO HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)	INT. (-)	EXT. (+) INT. (-)
27.5	54.375	50.0	70.0	90.0	70.0	27.5	90.375	50.0	70.0	90.0	70.0
33.5		50.0	70.0	90.0	70.0	33.5		50.0	70.0	90.0	70.0
39.5		50.0	70.0	90.0	70.0	39.5		50.0	70.0	90.0	70.0
45.5		50.0	70.0	88.5	70.0	45.5		50.0	70.0	85.0	70.0
51.5		44.2	70.0	78.2	70.0	51.5		44.2	70.0	78.2	70.0
57.5		44.2	70.0	78.3	70.0	57.5		-	70.0	70.0	70.0
63.5		48.7	70.0	79.7	70.0	63.5		-	63.4	63.4	63.4
69.5	60.375	41.8	68.4	68.4	68.4	69.5	96.375	-	53.8	53.8	-
27.5		50.0	70.0	90.0	70.0	27.5		50.0	70.0	90.0	70.0
33.5		50.0	70.0	90.0	70.0	33.5		50.0	70.0	90.0	70.0
39.5		50.0	70.0	90.0	70.0	39.5		50.0	70.0	90.0	70.0
45.5		50.0	70.0	88.5	70.0	45.5		50.0	70.0	83.3	70.0
51.5		44.2	70.0	78.2	70.0	51.5		-	70.0	76.7	70.0
57.5		39.6	70.0	70.0	70.0	57.5		-	70.0	70.0	70.0
63.5	66.375	39.6	70.0	70.1	70.0	63.5	102.375	-	58.9	58.9	-
69.5		43.4	70.0	73.6	70.0	66.5		-	56.2	56.2	-
27.5		50.0	70.0	90.0	70.0	27.5		50.0	70.0	90.0	70.0
33.5		50.0	70.0	90.0	70.0	33.5		50.0	70.0	90.0	70.0
39.5		50.0	70.0	90.0	70.0	39.5		50.0	70.0	90.0	70.0
45.5		50.0	70.0	88.5	70.0	45.5		50.0	70.0	81.8	70.0
51.5		44.2	70.0	78.2	70.0	51.5		-	70.0	75.1	70.0
57.5	72.375	39.6	70.0	70.0	70.0	57.5	108.375	-	70.0	70.0	70.0
63.5		35.8	63.4	63.4	63.4	63.5		-	58.9	58.9	-
69.5		35.9	63.5	63.5	63.5	27.5		50.0	70.0	90.0	70.0
27.5		50.0	70.0	90.0	70.0	33.5		50.0	70.0	90.0	70.0
33.5		50.0	70.0	90.0	70.0	39.5		50.0	70.0	89.6	70.0
39.5		50.0	70.0	90.0	70.0	45.5		-	70.0	80.5	70.0
45.5		50.0	70.0	88.5	70.0	51.5		-	70.0	73.7	70.0
51.5	78.375	44.2	70.0	78.2	70.0	57.5	114.375	-	65.0	65.0	-
57.5		39.6	70.0	70.0	70.0	60.5		-	61.8	61.8	-
63.5		35.8	63.4	63.4	63.4	27.5		50.0	70.0	90.0	70.0
69.5		-	57.9	57.9	57.9	33.5		50.0	70.0	90.0	70.0
27.5		50.0	70.0	90.0	70.0	39.5		50.0	70.0	88.6	70.0
33.5		50.0	70.0	90.0	70.0	45.5		-	70.0	79.4	70.0
39.5		50.0	70.0	90.0	70.0	51.5	120.375	-	65.0	65.0	-
45.5		50.0	70.0	88.5	70.0	57.5		-	65.0	65.0	-
51.5		44.2	70.0	78.2	70.0	27.5		50.0	70.0	90.0	70.0
57.5		39.6	70.0	70.0	70.0	33.5		50.0	70.0	90.0	70.0
63.5		-	63.4	63.4	63.4	38.5		50.0	70.0	89.5	70.0



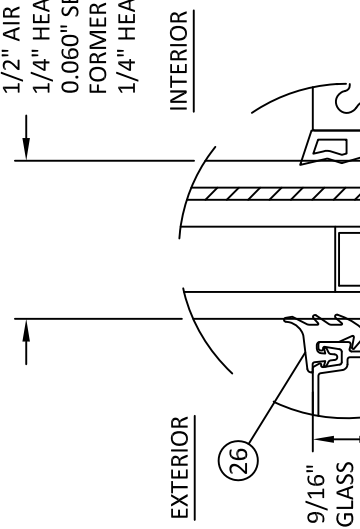
GLASS TYPES

LARGE & SMALL MISSILE IMPACT (CONTINUED)



GLAZING DETAIL H
(WET GLAZED)

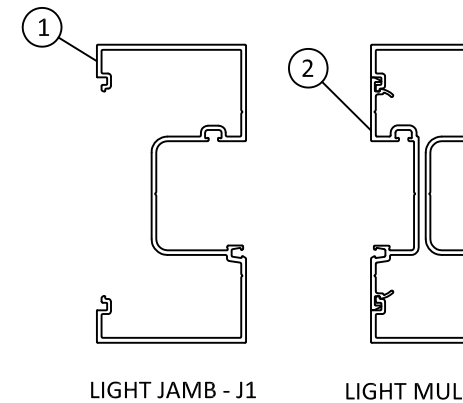
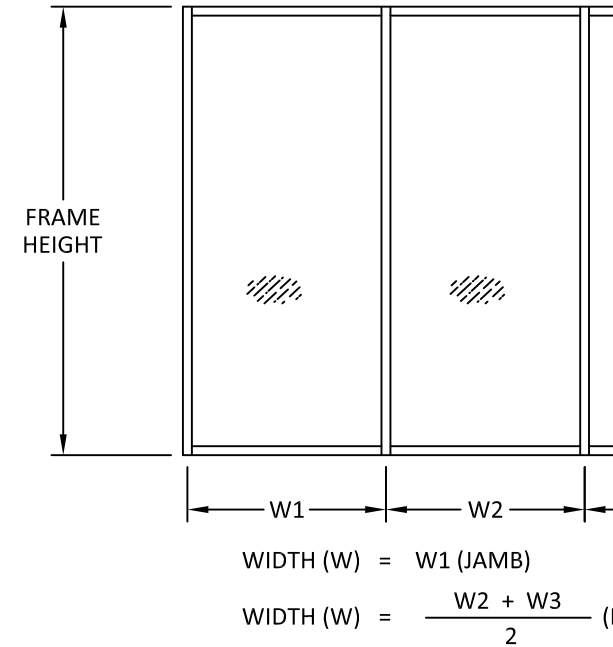
1-5/16" O.A. INSULATED LAMINATED GLASS CONSISTING OF:
1/4" TEMPERED GLASS,
1/2" AIR SPACE,
1/4" HEAT STRENGTHENED GLASS,
0.060" SENTRYGLAS BY KURARAY, FORMERLY KNOWN AS SGP BY DUPONT,
1/4" HEAT STRENGTHENED GLASS



MULLION LOAD TABLES

LIGHT CONFIGURATION

DESIGN LOAD CAPACITY - PSF				DESIGN LOAD CAPACITY - PSF			
NOMINAL DIMS.		LIGHT JAMB - J1	LIGHT MULLION - M1	NOMINAL DIMS.		LIGHT JAMB - J1	LIGHT MULLION - M1
WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)	WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)
30	72	50.0	50.0	30	90	50.0	50.0
33		50.0	50.0	33		50.0	50.0
36		50.0	50.0	36		50.0	50.0
39		50.0	50.0	39		50.0	50.0
42		50.0	50.0	42		50.0	50.0
45		50.0	50.0	45		50.0	50.0
48		50.0	50.0	48		50.0	50.0
51		50.0	50.0	51		50.0	50.0
54		50.0	50.0	54		50.0	48.4
57		50.0	50.0	57		50.0	45.9
60		50.0	50.0	30	96	50.0	50.0
63		50.0	50.0	33		50.0	50.0
66	78	50.0	50.0	36		50.0	50.0
69		50.0	50.0	39		50.0	50.0
72		50.0	50.0	42		50.0	50.0
30		50.0	50.0	45		50.0	50.0
33		50.0	50.0	48		50.0	47.9
36		50.0	50.0	51		50.0	45.1
39		50.0	50.0	54		50.0	42.6
42		50.0	50.0	30	102	50.0	50.0
45		50.0	50.0	33		50.0	50.0
48		50.0	50.0	36		50.0	50.0
51	84	50.0	50.0	39		50.0	50.0
54		50.0	50.0	42		50.0	48.5
57		50.0	50.0	45		50.0	45.2
60		50.0	50.0	48		50.0	42.4
63		50.0	50.0	51		50.0	40.7
66		50.0	50.0	30	108	50.0	50.0
30		50.0	50.0	33		50.0	50.0
33		50.0	50.0	36		50.0	50.0
36		50.0	50.0	39		50.0	46.6
39		50.0	50.0	42		50.0	43.2
42		50.0	50.0	45		50.0	40.3
45		50.0	50.0	48		50.0	37.8
48		50.0	50.0				

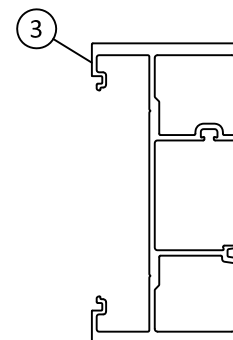


LIGHT CONFIGURATION

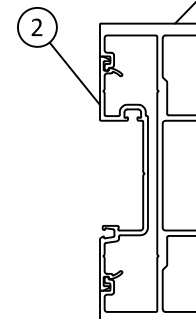
MULLION LOAD TABLES

MEDIUM CONFIGURATION

DESIGN LOAD CAPACITY - PSF					DESIGN LOAD CAPACITY - PSF				
NOMINAL DIMS.		MEDIUM JAMB - J2	MEDIUM JAMB - J3	MEDIUM MULLION - M2	NOMINAL DIMS.		MEDIUM JAMB - J2	MEDIUM JAMB - J3	MEDIUM MULLION - M2
WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)	EXT. (+) INT. (-)	WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)	EXT. (+) INT. (-)
30	60	70.0	70.0	70.0	30	84	70.0	70.0	70.0
36		70.0	70.0	70.0	36		70.0	70.0	70.0
42		70.0	70.0	70.0	42		70.0	70.0	70.0
48		70.0	70.0	70.0	48		70.0	70.0	70.0
54		70.0	70.0	70.0	54		70.0	70.0	70.0
60		70.0	70.0	70.0	60		70.0	70.0	70.0
66		70.0	70.0	70.0	66		70.0	70.0	70.0
72	66	70.0	70.0	70.0	72	90	70.0	70.0	70.0
30		70.0	70.0	70.0	30		70.0	70.0	70.0
36		70.0	70.0	70.0	36		70.0	70.0	70.0
42		70.0	70.0	70.0	42		70.0	70.0	70.0
48		70.0	70.0	70.0	48		70.0	70.0	70.0
54		70.0	70.0	70.0	54		70.0	70.0	70.0
60		70.0	70.0	70.0	60		70.0	70.0	70.0
66	72	70.0	70.0	70.0	66		70.0	70.0	70.0
72		70.0	70.0	70.0	72		70.0	67.2	64.7
30		70.0	70.0	70.0	30	96	70.0	70.0	70.0
36		70.0	70.0	70.0	36		70.0	70.0	70.0
42		70.0	70.0	70.0	42		70.0	70.0	70.0
48		70.0	70.0	70.0	48		70.0	70.0	70.0
54		70.0	70.0	70.0	54		70.0	70.0	70.0
60		70.0	70.0	70.0	60		70.0	70.0	68.2
66		70.0	70.0	70.0	66		70.0	64.5	62.0
72	78	70.0	70.0	70.0	72	102	70.0	70.0	70.0
30		70.0	70.0	70.0	30		70.0	70.0	70.0
36		70.0	70.0	70.0	36		70.0	70.0	70.0
42		70.0	70.0	70.0	42		70.0	70.0	70.0
48		70.0	70.0	70.0	48		70.0	70.0	70.0
54		70.0	70.0	70.0	54		70.0	69.8	67.2
60		70.0	70.0	70.0	60		70.0	62.8	60.4
66	78	70.0	70.0	70.0	30	108	70.0	70.0	70.0
72		70.0	70.0	70.0	36		70.0	70.0	70.0
					42		70.0	70.0	70.0
					48		70.0	70.0	70.0
					54		70.0	62.3	59.9
					60		70.0	56.0	53.9

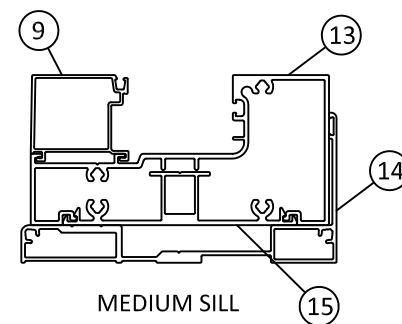


MEDIUM JAMB - J2

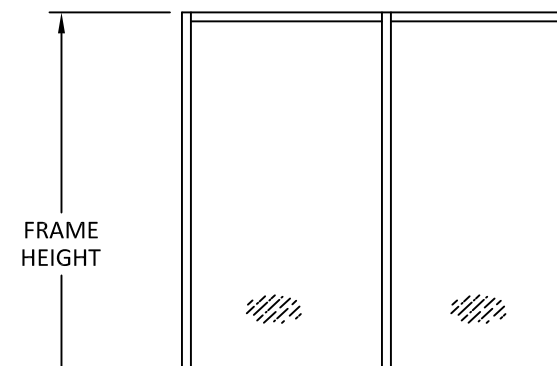


MEDIUM MULLION - M2

MEDIUM CONFIGURATION



MEDIUM SILL

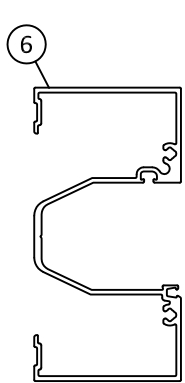


MULLION LOAD TABLES

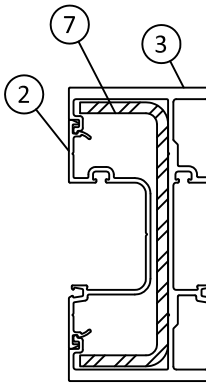
HEAVY CONFIGURATION

DESIGN LOAD CAPACITY - PSF			
NOMINAL DIMS.		HEAVY MULLION - M3	
WIDTH (W)	FRAME HEIGHT	EXT. (+)	INT. (-)
72	96	70.0	90.0
69	102	70.0	90.0
66	108	70.0	90.0
63	114	70.0	90.0
60	120	70.0	90.0
41	126	65.0	65.0
39	132	65.0	65.0
37	138	65.0	65.0
36	144	65.0	65.0

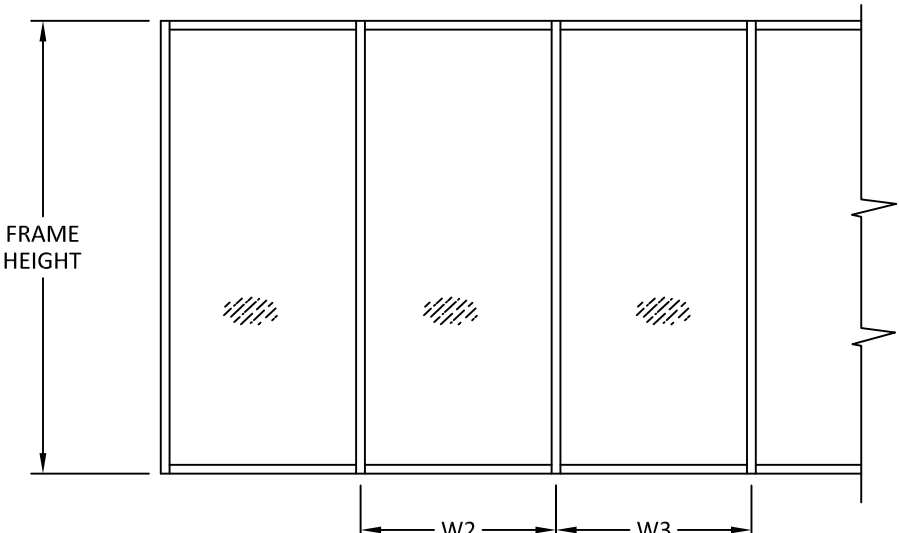
NOTE: HEAVY CONFIGURATION JAMBS ARE ANCHORED ALONG THEIR LENGTH AND THEREFORE DO NOT LIMIT DESIGN PRESSURE.



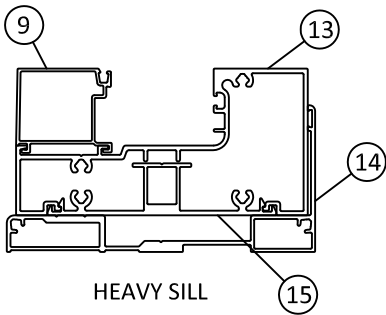
HEAVY JAMB - J2



HEAVY MULLION



HEAVY CONFIGURAT

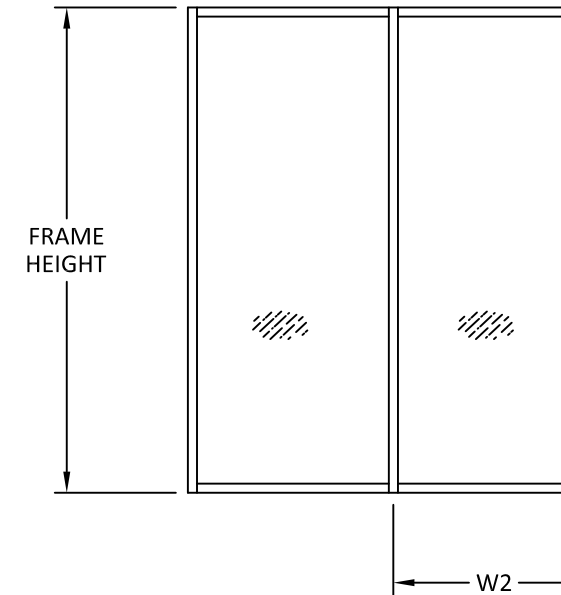


HEAVY SILL

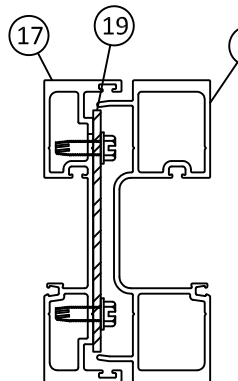
MULLION LOAD TABLES

EXPANSION MULLION

DESIGN LOAD CAPACITY - PSF			DESIGN LOAD CAPACITY - PSF			DESIGN LOAD CAPACITY - PSF		
NOMINAL DIMS.		EXPANSION MULLION	NOMINAL DIMS.		EXPANSION MULLION	NOMINAL DIMS.		EXPANSION MULLION
WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)
30	72	65.0	30	90	65.0	30	108	65.0
33		65.0	33		65.0	33		65.0
36		65.0	36		65.0	36		65.0
39		65.0	39		65.0	39		61.7
42		65.0	42		65.0	42		57.3
45		65.0	45		65.0	45		53.5
48		65.0	48		65.0	48		50.2
51		65.0	51		65.0	51		47.2
54		65.0	54		64.2	54		44.6
57		65.0	57		60.8	57		42.2
60		65.0	60		57.8	60		40.1
63		65.0	63		55.0	63		38.2
66		65.0	66		52.5	66		36.5
69		65.0	69		50.2	30	114	65.0
72		65.0	72		48.1	33		65.0
30	78	65.0	30	96	65.0	36		60.0
33		65.0	33		65.0	39		55.4
36		65.0	36		65.0	42		51.4
39		65.0	39		65.0	45		48.0
42		65.0	42		65.0	48		45.0
45		65.0	45		65.0	51		42.4
48		65.0	48		63.5	54		40.0
51		65.0	51		59.7	57		37.9
54		65.0	54		56.4	60		36.0
57		65.0	57		53.5	63		34.3
60		65.0	60		50.8	30	120	65.0
63		65.0	63		48.4	33		59.1
66		65.0	66		46.2	36		54.2
69		65.0	69		44.2	39		50.0
72		64.1	72		42.3	42		46.4
30	84	65.0	30	102	65.0	45		43.3
33		65.0	33		65.0	48		40.6
36		65.0	36		65.0	51		38.2
39		65.0	39		65.0	54		36.1
42		65.0	42		64.3	57		34.2
45		65.0	45		60.0	60		32.5
48		65.0	48		56.2	30	126	59.0
51		65.0	51		52.9	33		53.6
54		65.0	54		50.0	36		49.1
57		65.0	57		47.2	39		44.6
60		65.0	60		44.6	42		42.2
63		65.0	63		42.2	45		40.1
66		65.0	66		40.1	48		38.2
69		65.0	69		38.2	51		36.5



$$\text{WIDTH (W)} = \frac{W2 + W3}{2}$$

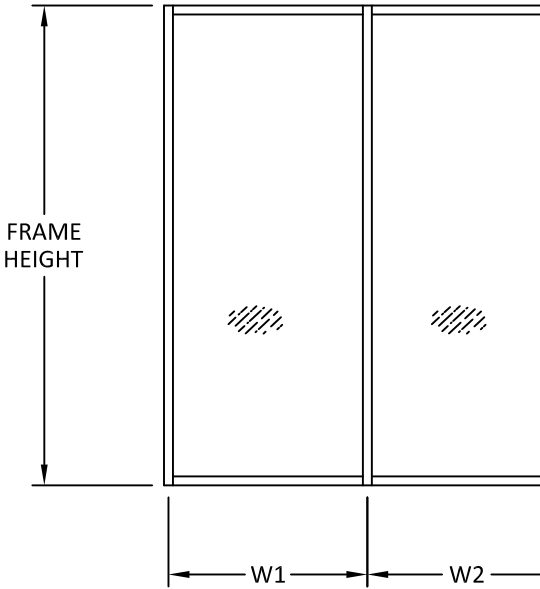


SMI MULLION LOAD TABLES

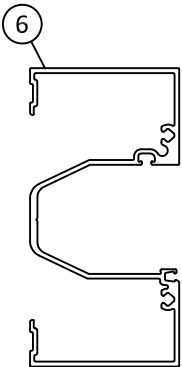
HEAVY CONFIGURATION FOR USE IN SMALL MISSILE IMPACT APPLICATIONS ONLY

DESIGN LOAD CAPACITY - PSF			
NOMINAL DIMS.		HEAVY MULLION - M3	
WIDTH (W)	FRAME HEIGHT	EXT. (+)	INT. (-)
72	96	70.0	90.0
69	102	70.0	90.0
66	108	70.0	90.0
63	114	70.0	90.0
57	120	70.0	90.0
60		70.0	88.7
41	126	70.0	90.0
39	132	70.0	90.0
37	138	70.0	90.0
33	144	70.0	90.0
36		67.5	86.8

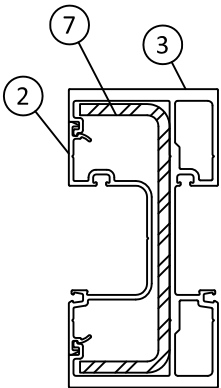
NOTE: HEAVY CONFIGURATION JAMBS ARE
ANCHORED ALONG THEIR LENGTH AND THEREFORE
DO NOT LIMIT DESIGN PRESSURE.



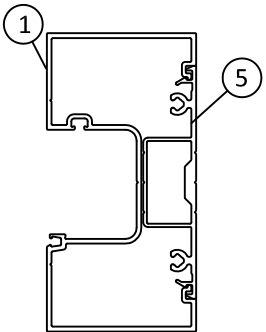
$$\text{WIDTH (W)} = \frac{W2 + W3}{2}$$



HEAVY JAMB - J4



HEAVY MULLION - M3



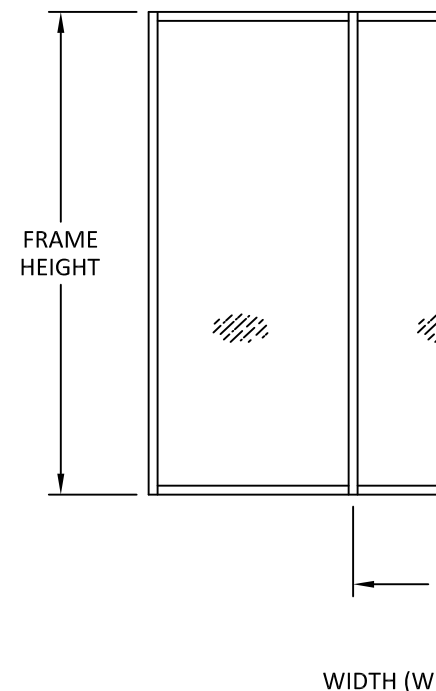
HEAVY JAMB - J5

CORNER MULLION LOAD TABLES

DESIGN LOAD CAPACITY - PSF			
NOMINAL DIMS.		90 DEGREE MULLION	135 DEGREE MULLION
WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)
30	72	70.0	70.0
33		70.0	70.0
36		70.0	70.0
39		70.0	70.0
42		70.0	70.0
45		70.0	70.0
48		70.0	70.0
51		70.0	70.0
54		70.0	70.0
57		70.0	68.6
60		69.4	65.2
63		66.1	62.1
66		63.1	59.2
69		60.4	56.7
72		57.9	54.3
30	78	70.0	70.0
33		70.0	70.0
36		70.0	70.0
39		70.0	70.0
42		70.0	70.0
45		70.0	70.0
48		70.0	69.4
51		69.6	65.3
54		65.7	61.7
57		62.3	58.4
60		59.2	55.5
63		56.4	52.9
66		53.8	50.5
69		51.5	48.3
72		49.3	46.3
30	84	70.0	70.0
33		70.0	70.0
36		70.0	70.0
39		70.0	70.0
42		70.0	68.4
45		68.0	63.8
48		63.8	59.8
51		60.0	56.3
54		56.7	53.2

DESIGN LOAD CAPACITY - PSF			
NOMINAL DIMS.		90 DEGREE MULLION	135 DEGREE MULLION
WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)
30	90	70.0	70.0
33		70.0	70.0
36		70.0	69.5
39		68.4	64.2
42		63.5	59.6
45		59.3	55.6
48		55.6	52.1
51		52.3	49.1
54		49.4	46.3
57		46.8	43.9
60		44.4	41.7
63		42.3	39.7
66		40.4	37.9
69		38.6	36.3
72		37.0	34.8
30	96	70.0	70.0
33		70.0	66.6
36		65.1	61.1
39		60.1	56.4
42		55.8	52.4
45		52.1	48.9
48		48.8	45.8
51		46.0	43.1
54		43.4	40.7
57		41.1	38.6
60		39.1	36.7
63		37.2	34.9
66		35.5	33.3
69		34.0	31.9
72		32.6	30.5
30	102	69.2	64.9
33		62.9	59.0
36		57.7	54.1
39		53.2	49.9
42		49.4	46.4
45		46.1	43.3
48		43.3	40.6
51		40.7	38.2
54		38.4	36.1

DESIGN LOAD CAPACITY - PSF			
NOMINAL DIMS.		90 DEGREE MULLION	135 DEGREE MULLION
WIDTH (W)	FRAME HEIGHT	EXT. (+) INT. (-)	EXT. (+) INT. (-)
30	108	61.7	57.9
33		56.1	52.7
36		51.4	48.3
39		47.5	44.6
42		44.1	41.4
45		41.2	38.6
48		38.6	36.2
51		36.3	34.1
54		34.3	32.2
57		32.5	30.5
60		30.9	29.0
63		29.4	27.6
66		28.1	26.3
30	114	55.4	52.0
33		50.4	47.3
36		46.2	43.3
39		42.6	40.0
42		39.6	37.1
45		36.9	34.7
48		34.6	32.5
51		32.6	30.6
54		30.8	28.9
57		29.2	27.4
60		27.7	26.0
63		26.4	24.8
30	120	50.0	46.9
33		45.5	42.7
36		41.7	39.1
39		38.5	36.1
42		35.7	33.5
45		33.3	31.3
48		31.2	29.3
51		29.4	27.6
54		27.8	26.1
57		26.3	24.7
60		25.0	23.5
30	126	45.4	42.6
33		41.2	38.7
36		37.8	35.5



ANCHOR TYPE 'A & B' TABLES

ANCHOR LOAD CAPACITY - PSF EXT. (+) & INT. (-)					
NOMINAL DIMS.		ANCHORS TYPE 'A'		ANCHORS TYPE 'B'	
WIDTH (W)	FRAME HEIGHT	A2	A3	B2	B3
30.0	72.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		90.0	90.0	90.0	90.0
42.0		90.0	90.0	90.0	90.0
45.0		90.0	90.0	90.0	90.0
48.0		90.0	90.0	90.0	90.0
51.0		90.0	90.0	90.0	90.0
54.0		90.0	90.0	90.0	90.0
57.0		90.0	90.0	90.0	90.0
60.0		90.0	90.0	90.0	90.0
63.0		87.9	90.0	90.0	90.0
66.0		83.9	90.0	90.0	90.0
69.0		80.3	90.0	90.0	90.0
72.0		76.9	90.0	87.7	90.0
30.0	78.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		90.0	90.0	90.0	90.0
42.0		90.0	90.0	90.0	90.0
45.0		90.0	90.0	90.0	90.0
48.0		90.0	90.0	90.0	90.0
51.0		90.0	90.0	90.0	90.0
54.0		90.0	90.0	90.0	90.0
57.0		89.7	90.0	90.0	90.0
60.0		85.2	90.0	90.0	90.0
63.0		81.2	90.0	90.0	90.0
66.0		77.5	90.0	88.3	90.0
69.0		74.1	90.0	84.5	90.0
72.0		71.0	90.0	80.9	90.0
30.0	84.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		90.0	90.0	90.0	90.0
42.0		90.0	90.0	90.0	90.0
45.0		90.0	90.0	90.0	90.0
48.0		90.0	90.0	90.0	90.0
51.0		90.0	90.0	90.0	90.0
54.0		87.9	90.0	90.0	90.0
57.0		83.3	90.0	90.0	90.0
60.0		79.1	90.0	90.0	90.0
63.0		75.4	90.0	85.9	90.0
66.0		71.0	90.0	80.9	90.0
69.0		66.0	90.0	75.4	90.0
72.0		61.6	90.0	70.2	90.0

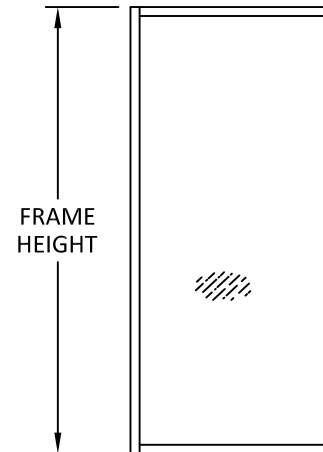
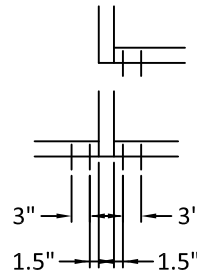
ANCHOR LOAD CAPACITY - PSF EXT. (+) & INT. (-)					
NOMINAL DIMS.		ANCHORS TYPE 'A'		ANCHORS TYPE 'B'	
WIDTH (W)	FRAME HEIGHT	A2	A3	A4	B3
30.0	90.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		90.0	90.0	90.0	90.0
42.0		90.0	90.0	90.0	90.0
45.0		90.0	90.0	90.0	90.0
48.0		90.0	90.0	90.0	90.0
51.0		86.9	90.0	90.0	90.0
54.0		82.1	90.0	90.0	90.0
57.0		77.8	90.0	90.0	88.6
60.0		73.9	90.0	90.0	84.2
63.0		70.3	90.0	90.0	80.2
66.0		67.2	90.0	90.0	76.5
69.0		64.2	90.0	90.0	73.2
72.0		61.6	90.0	90.0	70.2
30.0	96.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		90.0	90.0	90.0	90.0
42.0		90.0	90.0	90.0	90.0
45.0		90.0	90.0	90.0	90.0
48.0		86.6	90.0	90.0	90.0
51.0		81.5	90.0	90.0	90.0
54.0		76.9	90.0	90.0	87.7
57.0		72.9	90.0	90.0	83.1
60.0		69.2	90.0	90.0	78.9
63.0		66.0	90.0	90.0	75.2
66.0		63.0	90.0	90.0	71.7
69.0		60.2	90.0	90.0	68.6
72.0		57.7	86.6	90.0	65.8
30.0	102.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		90.0	90.0	90.0	90.0
42.0		90.0	90.0	90.0	90.0
45.0		86.9	90.0	90.0	90.0
48.0		81.5	90.0	90.0	90.0
51.0		76.7	90.0	90.0	87.4
54.0		72.4	90.0	90.0	82.5
57.0		68.6	90.0	90.0	78.2
60.0		65.2	90.0	90.0	74.3
63.0		62.1	90.0	90.0	70.7
66.0		58.9	86.6	90.0	67.2
69.0		55.7	82.1	90.0	63.8
72.0		52.4	77.8	90.0	60.4

ANCHOR LOAD CAPACITY - PSF EXT. (+) & INT. (-)					
NOMINAL DIMS.		ANCHORS TYPE 'A'		ANCHORS TYPE 'B'	
WIDTH (W)	FRAME HEIGHT	A2	A3	A4	B3
30.0	108.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		90.0	90.0	90.0	90.0
42.0		87.9	90.0	90.0	90.0
45.0		82.1	90.0	90.0	90.0
48.0		76.9	90.0	90.0	87.7
51.0		72.4	90.0	90.0	82.5
54.0		68.4	90.0	90.0	77.9
57.0		64.8	90.0	90.0	73.8
60.0		61.6	90.0	90.0	70.2
63.0		58.6	87.9	90.0	66.8
66.0		56.0	83.9	90.0	63.8
30.0	114.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		89.7	90.0	90.0	90.0
42.0		83.3	90.0	90.0	90.0
45.0		77.8	90.0	90.0	88.6
48.0		72.9	90.0	90.0	83.1
51.0		68.6	90.0	90.0	78.2
54.0		64.8	90.0	90.0	73.8
57.0		61.4	90.0	90.0	70.0
60.0		58.3	87.5	90.0	66.5
63.0		55.5	83.3	90.0	63.3
30.0	120.0	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		90.0	90.0	90.0	90.0
39.0		85.2	90.0	90.0	90.0
42.0		79.1	90.0	90.0	90.0
45.0		73.9	90.0	90.0	84.2
48.0		69.2	90.0	90.0	78.9
51.0		65.2	90.0	90.0	74.3
54.0		61.6	90.0	90.0	70.2
57.0		58.3	87.5	90.0	66.5
60.0		55.4	83.1	90.0	63.1
30.0	126	90.0	90.0	90.0	90.0
33.0		90.0	90.0	90.0	90.0
36.0		87.9	90.0	90.0	90.0
39.0		81.2	90.0	90.0	90.0
41.0		77.2	90.0	90.0	88.0
30.0		90.0	90.0	90.0	90.0

ANCHORS TYPES: SEE

A2 = (2) ANCHORS TY
A3 = (3) ANCHORS TY
A4 = (4) ANCHORS TY
B2 = (2) ANCHORS TY
B3 = (3) ANCHORS TY

ALL OTHER ANCHORS TO

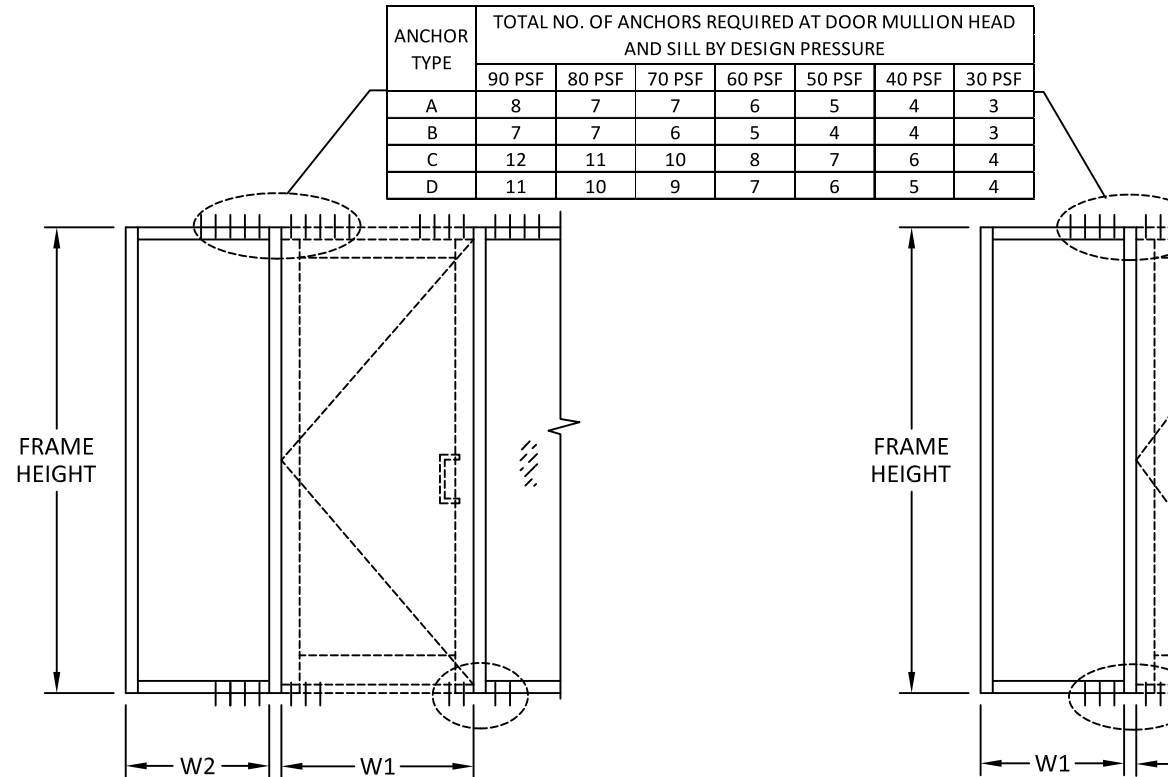


ANCHOR TYPE 'C & D' TABLES

ANCHOR LOAD CAPACITY - PSF EXT. (+) & INT. (-)									ANCHOR LOAD CAPACITY - PSF EXT. (+) & INT. (-)									ANCHOR LOAD CAPACITY - PSF EXT. (+) & INT. (-)												
NOMINAL DIMS.		ANCHORS TYPE 'C'				ANCHORS TYPE 'D'			NOMINAL DIMS.		ANCHORS TYPE 'C'				ANCHORS TYPE 'D'					NOMINAL DIMS.		ANCHORS TYPE 'C'				ANCHORS TYPE 'D'				
WIDTH (W)	FRAME HEIGHT	C2	C3	C4	C5	D2	D3	D4	WIDTH (W)	FRAME HEIGHT	C2	C3	C4	C5	D2	D3	D4	D5	WIDTH (W)	FRAME HEIGHT	C2	C3	C4	C5	D2	D3	D4	D5		
30.0	72.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	30.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	30.0	108.0	81.8	90.0	90.0	90.0	90.0	90.0	90.0	90.0		
33.0		90.0	90.0	90.0	90.0	90.0	90.0	90.0	33.0		89.3	90.0	90.0	90.0	90.0	90.0	90.0	90.0	33.0		74.4	90.0	90.0	90.0	83.9	90.0	90.0	90.0		
36.0		90.0	90.0	90.0	90.0	90.0	90.0	90.0	36.0		81.8	90.0	90.0	90.0	90.0	90.0	90.0	90.0	36.0		68.2	90.0	90.0	90.0	76.9	90.0	90.0	90.0		
39.0		90.0	90.0	90.0	90.0	90.0	90.0	90.0	39.0		75.5	90.0	90.0	90.0	85.2	90.0	90.0	90.0	39.0		62.9	90.0	90.0	90.0	71.0	90.0	90.0	90.0		
42.0		87.7	90.0	90.0	90.0	90.0	90.0	90.0	42.0		70.1	90.0	90.0	90.0	79.1	90.0	90.0	90.0	42.0		58.4	87.7	90.0	90.0	66.0	90.0	90.0	90.0		
45.0		81.8	90.0	90.0	90.0	90.0	90.0	90.0	45.0		65.5	90.0	90.0	90.0	73.9	90.0	90.0	90.0	45.0		54.5	81.8	90.0	90.0	61.6	90.0	90.0	90.0		
48.0		76.7	90.0	90.0	90.0	86.6	90.0	90.0	48.0		61.4	90.0	90.0	90.0	69.3	90.0	90.0	90.0	48.0		51.1	76.7	90.0	90.0	57.7	86.6	90.0	90.0		
51.0		72.2	90.0	90.0	90.0	81.5	90.0	90.0	51.0		57.8	86.6	90.0	90.0	65.2	90.0	90.0	90.0	51.0		48.1	72.2	90.0	90.0	54.3	81.5	90.0	90.0		
54.0		68.2	90.0	90.0	90.0	76.9	90.0	90.0	54.0		54.5	81.8	90.0	90.0	61.6	90.0	90.0	90.0	54.0		45.5	68.2	90.0	90.0	51.3	76.9	90.0	90.0		
57.0		64.6	90.0	90.0	90.0	72.9	90.0	90.0	57.0		51.7	77.5	90.0	90.0	58.3	87.5	90.0	90.0	57.0		43.1	64.6	86.1	90.0	48.6	72.9	90.0	90.0		
60.0		61.4	90.0	90.0	90.0	69.3	90.0	90.0	60.0		49.1	73.6	90.0	90.0	55.4	83.1	90.0	90.0	60.0		40.9	61.4	81.8	90.0	46.2	69.3	90.0	90.0		
63.0		58.4	87.7	90.0	90.0	66.0	90.0	90.0	63.0		46.8	70.1	90.0	90.0	52.8	79.1	90.0	90.0	63.0		39.0	58.4	77.9	90.0	44.0	66.0	87.9	90.0		
66.0	55.8	83.7	90.0	90.0	63.0	90.0	90.0	66.0	44.6	66.9	89.3	90.0	50.4	75.5	90.0	90.0	66.0	37.2	55.8	74.4	90.0	42.0	63.0	83.9	90.0					
69.0	53.4	80.0	90.0	90.0	60.2	90.0	90.0	69.0	42.7	64.0	85.4	90.0	48.2	72.3	90.0	90.0	30.0	77.5	90.0	90.0	90.0	87.5	90.0	90.0	90.0					
72.0	51.1	76.7	90.0	90.0	57.7	86.6	90.0	72.0	40.9	61.4	81.8	90.0	46.2	69.3	90.0	90.0	33.0	70.5	90.0	90.0	90.0	79.5	90.0	90.0	90.0					
30.0	78.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	30.0	96.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	36.0	114.0	64.6	90.0	90.0	90.0	72.9	90.0	90.0	90.0		
33.0		90.0	90.0	90.0	90.0	90.0	90.0	90.0	33.0		83.7	90.0	90.0	90.0	90.0	90.0	90.0	90.0	39.0		59.6	89.4	90.0	90.0	67.3	90.0	90.0	90.0		
36.0		90.0	90.0	90.0	90.0	90.0	90.0	90.0	36.0		76.7	90.0	90.0	90.0	86.6	90.0	90.0	90.0	42.0		55.4	83.0	90.0	90.0	62.5	90.0	90.0	90.0		
39.0		87.1	90.0	90.0	90.0	90.0	90.0	90.0	39.0		70.8	90.0	90.0	90.0	79.9	90.0	90.0	90.0	45.0		51.7	77.5	90.0	90.0	58.3	87.5	90.0	90.0		
42.0		80.9	90.0	90.0	90.0	90.0	90.0	90.0	42.0		65.7	90.0	90.0	90.0	74.2	90.0	90.0	90.0	48.0		48.4	72.7	90.0	90.0	54.7	82.0	90.0	90.0		
45.0		75.5	90.0	90.0	90.0	85.2	90.0	90.0	45.0		61.4	90.0	90.0	90.0	69.3	90.0	90.0	90.0	51.0		45.6	68.4	90.0	90.0	51.5	77.2	90.0	90.0		
48.0		70.8	90.0	90.0	90.0	79.9	90.0	90.0	48.0		57.5	86.3	90.0	90.0	64.9	90.0	90.0	90.0	54.0		43.1	64.6	86.1	90.0	48.6	72.9	90.0	90.0		
51.0		66.6	90.0	90.0	90.0	75.2	90.0	90.0	51.0		54.1	81.2	90.0	90.0	61.1	90.0	90.0	90.0	57.0		40.8	61.2	81.6	90.0	46.0	69.1	90.0	90.0		
54.0		62.9	90.0	90.0	90.0	71.0	90.0	90.0	54.0		51.1	76.7	90.0	90.0	57.7	86.6	90.0	90.0	60.0		38.8	58.1	77.5	90.0	43.7	65.6	87.5	90.0		
57.0		59.6	89.4	90.0	90.0	67.3	90.0	90.0	57.0		48.4	72.7	90.0	90.0	54.7	82.0	90.0	90.0	63.0		36.9	55.4	73.8	90.0	41.7	62.5	83.3	90.0		
60.0		56.6	85.0	90.0	90.0	63.9	90.0	90.0	60.0		46.0	69.0	90.0	90.0	51.9	77.9	90.0	90.0	30.0		73.6	90.0	90.0	90.0	83.1	90.0	90.0	90.0		
63.0		53.9	80.9	90.0	90.0	60.9	90.0	90.0	63.0		43.8	65.7	87.7	90.0	49.5	74.2	90.0	90.0	33.0		66.9	90.0	90.0	90.0	75.5	90.0	90.0	90.0		
66.0	51.5	77.2	90.0	90.0	58.1	87.2	90.0	66.0	41.8	62.8	83.7	90.0	47.2	70.8	90.0	90.0	36.0	61.4	90.0	90.0	90.0	69.3	90.0	90.0	90.0					
69.0	49.3	73.9	90.0	90.0	55.6	83.4	90.0	69.0	40.0	60.0	80.0	90.0	45.2	67.7	90.0	90.0	39.0	56.6	85.0	90.0	90.0	63.9	90.0	90.0	90.0					
72.0	47.2	70.8	90.0	90.0	53.3	79.9	90.0	72.0	38.4	57.5	76.7	90.0	43.3	64.9	86.6	90.0	42.0	52.6	78.9	90.0	90.0	59.4	89.0	90.0	90.0					
30.0	84.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	30.0	102.0	86.6	90.0	90.0	90.0	90.0	90.0	90.0	90.0	45.0	120.0	49.1	73.6	90.0	90.0	55.4	83.1	90.0	90.0		
33.0		90.0	90.0	90.0	90.0	90.0	90.0	90.0	33.0		78.8	90.0	90.0	90.0	88.9	90.0	90.0	90.0	48.0		46.0	69.0	90.0	90.0	51.9	77.9	90.0	90.0		
36.0		87.7	90.0	90.0	90.0	90.0	90.0	90.0	36.0		72.2	90.0	90.0	90.0	81.5	90.0	90.0	90.0	51.0		43.3	65.0	86.6	90.0	48.9	73.3	90.0	90.0		
39.0		80.9	90.0	90.0	90.0	90.0	90.0	90.0	39.0		66.6	90.0	90.0	90.0	75.2	90.0	90.0	90.0	54.0		40.9	61.4	81.8	90.0	46.2	69.3	90.0	90.0		
42.0		75.1	90.0	90.0	90.0	84.8	90.0	90.0	42.0		61.9	90.0	90.0	90.0	69.8	90.0	90.0	90.0	57.0		38.8	58.1	77.5	90.0	43.7	65.6	87.5	90.0		
45.0		70.1	90.0	90.0	90.0	79.1	90.0	90.0	45.0		57.8	86.6	90.0	90.0	65.2	90.0	90.0	90.0	60.0		36.8	55.2	73.6	90.0	41.6	62.3	83.1	90.0		
48.0		65.7	90.0	90.0	90.0	74.2	90.0	90.0	48.0		54.1	81.2	90.0	90.0	61.1	90.0	90.0	90.0	30.0		70.1	90.0	90.0	90.0	79.1	90.0	90.0	90.0		
51.0		61.9	90.0	90.0	90.0	69.8	90.0	90.0	51.0		51.0	76.4	90.0	90.0	57.5	86.3	90.0	90.0	33.0		63.8	90.0	90.0	90.0	72.0	90.0	90.0	90.0		
54.0		58.4	87.7	90.0	90.0	66.0	90.0	90.0	54.0		48.1	72.2	90.0	90.0	54.3	81.5	90.0	90.0	36.0		58.4	87.7	90.0	90.0	66.0	90.0	90.0	90.0		
57.0		55.4	83.0	90.0	90.0	62.5	90.0	90.0	57.0		45.6	68.4	90.0	90.0	51.5	77.2	90.0	90.0	39.0		53.9	80.9	90.0	90.0	60.9	90.0	90.0	90.0		
60.0		52.6	78.9	90.0	90.0	59.4	89.0	90.0	60.0		43.3	65.0	86.6	90.0	48.9	73.3	90.0	90.0	41.0		51.3	77.0	90.0	90.0	57.9	86.9	90.0	90.0		
63.0		50.1	75.1	90.0	90.0	56.5	84.8	90.0	63.0		41.3	61.9	82.5	90.0	46.6	69.8	90.0	90.0	30.0		66.9	90.0	90.0	90.0	75.5	90.0	90.0	90.0		
66.0	47.8	71.7	90.0	90.0	54.0	80.9	90.0	66.0	39.4	59.1	78.8	90.0	44.4	66.7	88.9	90.0	33.0	60.9	90.0	90.0	90.0	68.7	90.0	90.0	90.0					

DOOR MULLION LOAD CAPACITY (PSF)					
NOMINAL DIMS.		WITHOUT STEEL REINF.		WITH STEEL REINF.	
WIDTH (W)	FRAME HEIGHT	EXT. (+)	INT. (-)	EXT. (+)	INT. (-)
24	102	70.0	70.0	70.0	90.0
30		70.0	70.0	70.0	90.0
36		70.0	70.0	70.0	90.0
42		70.0	70.0	70.0	90.0
48		70.0	70.0	70.0	90.0
54		70.0	70.0	70.0	90.0
60		70.0	70.0	70.0	90.0
24	108	70.0	70.0	70.0	90.0
30		70.0	70.0	70.0	90.0
36		70.0	70.0	70.0	90.0
42		70.0	70.0	70.0	90.0
48		70.0	70.0	70.0	90.0
54		70.0	70.0	70.0	90.0
60		70.0	70.0	70.0	90.0
24	114	70.0	70.0	70.0	90.0
30		70.0	70.0	70.0	90.0
36		70.0	70.0	70.0	90.0
42		70.0	70.0	70.0	90.0
48		70.0	70.0	70.0	90.0
54		70.0	70.0	70.0	90.0
60		70.0	70.0	70.0	90.0
24	120	70.0	70.0	70.0	90.0
30		70.0	70.0	70.0	90.0
36		70.0	70.0	70.0	90.0
42		70.0	70.0	70.0	90.0
48		70.0	70.0	70.0	90.0
54		69.2	69.2	70.0	90.0
60		62.3	62.3	70.0	90.0
24	126	70.0	70.0	70.0	90.0
30		70.0	70.0	70.0	90.0
36		70.0	70.0	70.0	90.0
42		70.0	70.0	70.0	90.0
48		67.3	67.3	70.0	90.0
54		59.8	59.8	70.0	90.0
60		57.1	57.1	70.0	90.0
24	132	70.0	70.0	70.0	90.0
30		70.0	70.0	70.0	90.0
36		70.0	70.0	70.0	90.0
42		66.9	66.9	70.0	90.0
48		58.5	58.5	70.0	90.0
54		57.1	57.1	70.0	90.0
60		52.4	52.4	64.2	82.6
24		70.0	70.0	70.0	90.0
30		70.0	70.0	70.0	90.0

DOOR MULLION LOAD & ANCHOR TABLES



$$\text{WIDTH (W)} = \frac{W1 + W2}{2}$$

SINGLE DOOR

ANCHOR TYPE	TOTAL NO. OF ANCHORS REQUIRED AT DOOR MULLION HEAD AND SILL BY DESIGN PRESSURE						
	90 PSF	80 PSF	70 PSF	60 PSF	50 PSF	40 PSF	30 PSF
A	8	7	7	6	5	4	3
B	7	7	6	5	4	4	3
C	12	11	10	8	7	6	4
D	11	10	9	7	6	5	4

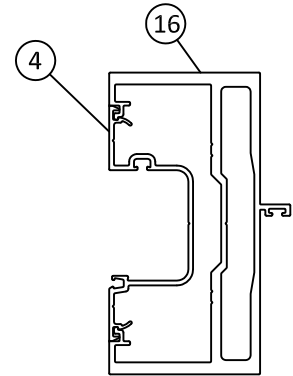


FRAME HEIGHT

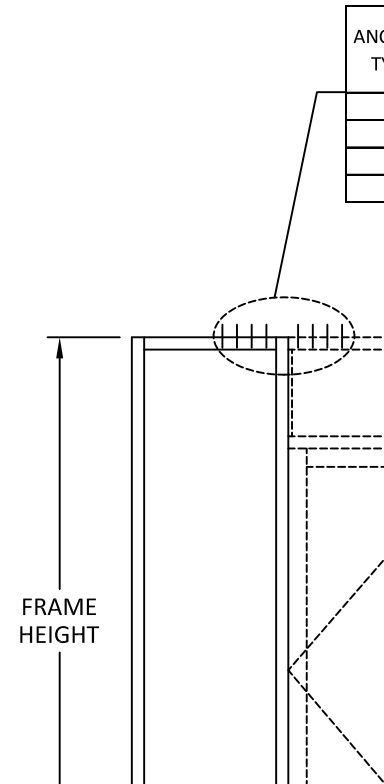
DOOR MULLION LOAD & ANCHOR TABLES

DOOR MULLION LOAD CAPACITY (PSF)						
NOMINAL DIMS.			WITHOUT STEEL REINF.		WITH STEEL REINF.	
FRAME HEIGHT (IN.)	DOOR PANEL WIDTH - W1 (IN.)	SIDELITE WIDTH - W2 (IN.)	EXT. (+)	INT. (-)	EXT. (+)	INT. (-)
96	36	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
	42	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
	48	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
102	36	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
	42	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
	48	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
108	36	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
	42	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	70.0	70.0	70.0	90.0
	48	30	70.0	70.0	70.0	90.0
		36	70.0	70.0	70.0	90.0
		42	70.0	70.0	70.0	90.0
		48	57.1	57.1	70.0	90.0

DOOR MULLION LOAD CAPACITY (PSF)						
NOMINAL DIMS.			WITHOUT STEEL REINF.		WITH STEEL REINF.	
FRAME HEIGHT (IN.)	DOOR PANEL WIDTH - W1 (IN.)	SIDELITE WIDTH - W2 (IN.)	EXT. (+)	INT. (-)	EXT. (+)	INT. (-)
120	36	30	69.9	69.9	70.0	90.0
		36	66.2	66.2	70.0	90.0
		42	62.8	62.8	70.0	90.0
		48	59.8	59.8	70.0	90.0
	42	30	62.8	62.8	70.0	90.0
		36	59.8	59.8	70.0	90.0
		42	57.1	57.1	70.0	90.0
		48	57.1	57.1	70.0	90.0
	48	30	57.1	57.1	70.0	90.0
		36	57.1	57.1	70.0	90.0
		42	57.1	57.1	70.0	90.0
		44	57.1	57.1	70.0	90.0
126	36	30	60.4	60.4	70.0	90.0
		36	57.2	57.2	70.0	90.0
		42	57.1	57.1	70.0	90.0
		48	57.1	57.1	70.0	90.0
	42	30	57.1	57.1	70.0	90.0
		36	57.1	57.1	70.0	90.0
		42	55.2	55.2	67.6	86.9
		48	52.7	52.7	64.7	83.1
	48	30	55.2	55.2	67.6	86.9
		36	52.7	52.7	64.7	83.1
		38	52.0	52.0	63.7	81.9
		30	57.1	57.1	70.0	90.0
132	36	36	55.6	55.6	68.2	87.7
		42	52.8	52.8	64.7	83.2
		48	50.3	50.3	61.6	79.2
		30	52.8	52.8	64.7	83.2
	42	36	50.3	50.3	61.6	79.2
		42	48.0	48.0	58.8	75.6
		44	47.3	47.3	57.9	74.5
		30	48.0	48.0	58.8	75.6
	48	32	47.3	47.3	57.9	74.5
		30	51.4	51.4	63.0	81.0
		36	48.7	48.7	59.7	76.7
		42	46.2	46.2	56.7	72.9
138	36	48	44.0	44.0	53.9	69.4
		30	46.2	46.2	56.7	72.9

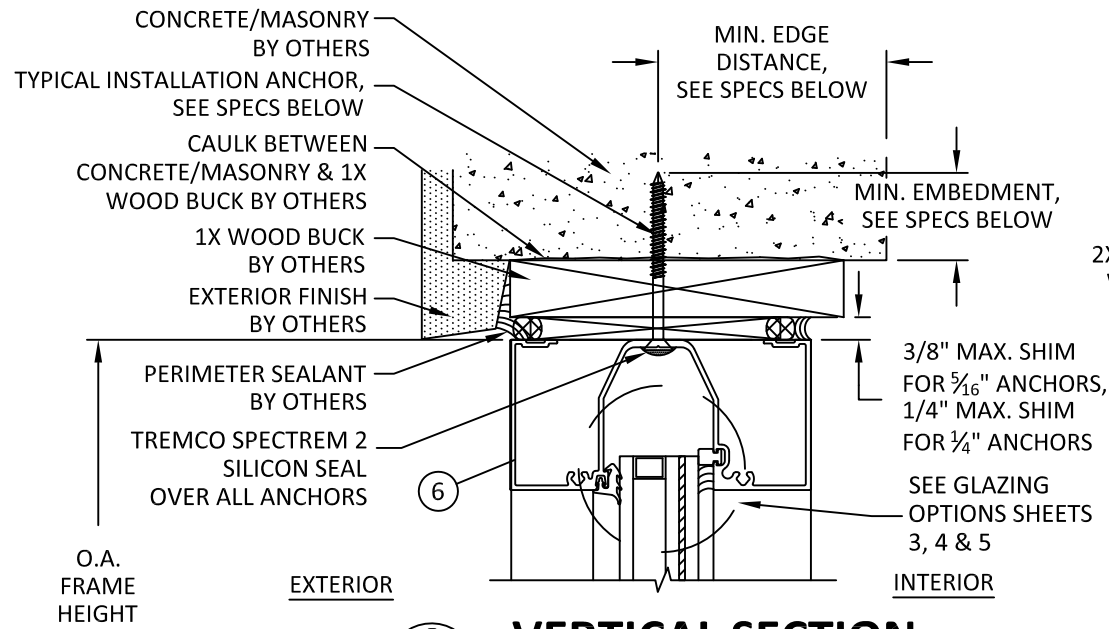


DOOR MULLION
WITHOUT STEEL REINFORCEMENT

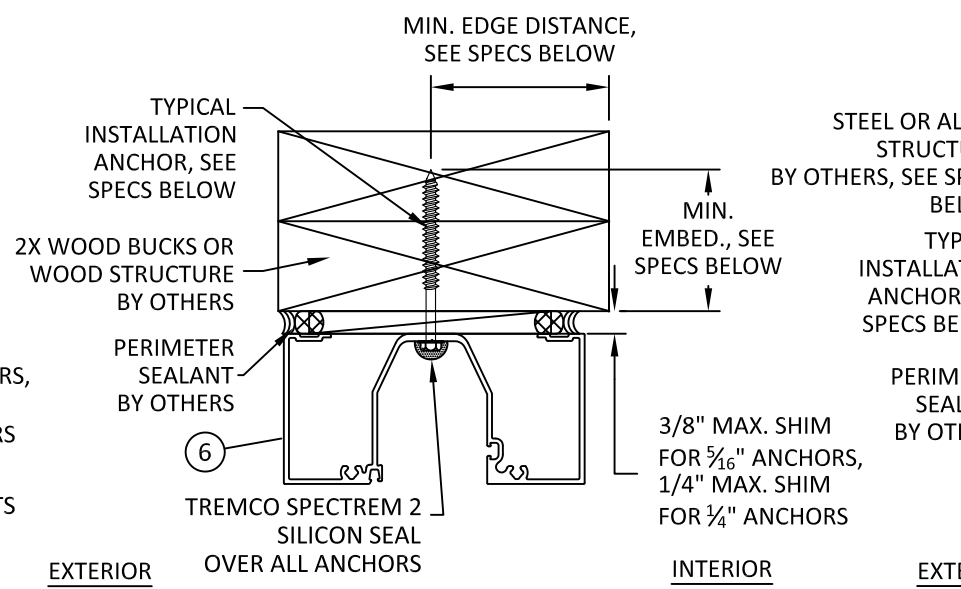


ANCHOR
TYP.

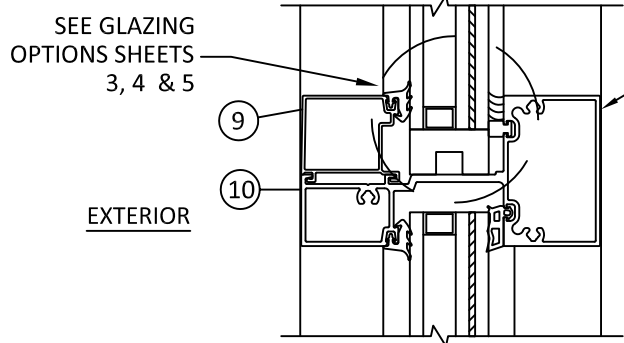
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c:\pcc\111111\111111.dwg
14218.4\yakk164 yhs 50 ft og w3.dwg
11/11/2017 (6th edition) code change\week 2 - (aug 4th) documents\dwgs\14218.4\yakk164 yhs 50 ft og w3.dwg



A
16 **VERTICAL SECTION**
HEAD - CONCRETE/MASONRY W/ 1X BUCK
LIGHT CONFIGURATION



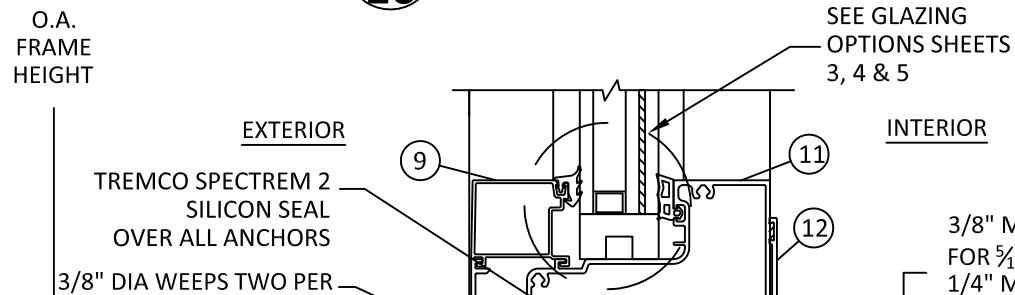
D
16 **VERTICAL SECTION**
HEAD - WOOD FRAMING
TYPICAL INSTALLATION



B
16 **VERTICAL SECTION**
HORIZONTAL MEMBER

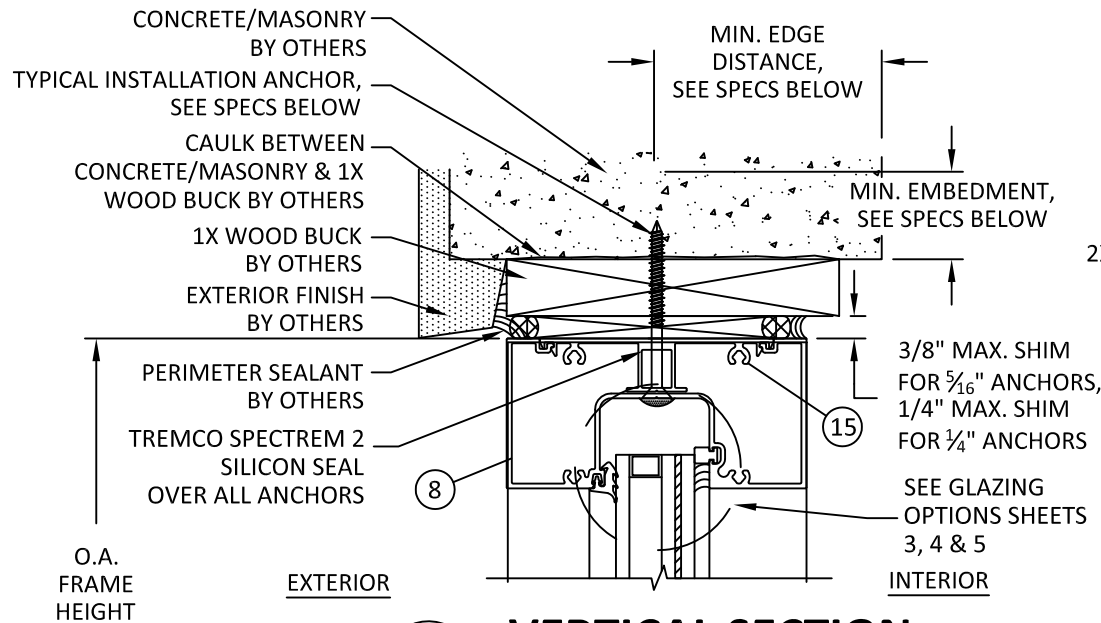
LIMIT DESIGN LOADS FOR HORIZONTAL AS FOLLOWS		
MAX HORIZ. SPAN	MAX GLASS HEIGHT ABOVE HORIZ.	MAX DESIGN LOADS
60"	57-1/2"	70 PSF
60"	84"	52 PSF
66"	55-15/16"	44 PSF
66"	84"	32 PSF
72"	55-15/16"	30 PSF
72"	84"	20 PSF

DESIGN LOADS SHOWN ABOVE ARE BASED ON MAX. GLASS AREA ABOVE HORIZONTAL, FOR SIZES SMALLER THAN SHOWN ABOVE, ALLOWABLE DESIGN LOADS MAY BE CALCULATED SEPARATELY.

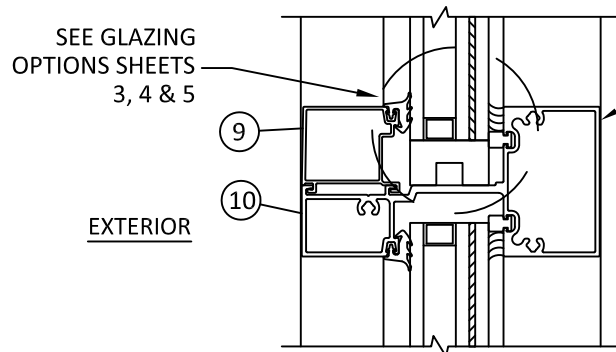


YH	
ANCHOR TYPE	ANCHOR DESCRIPTION
A	5/16" DIA. TAPCON BY ITW (Fu=125 KSI, Fy=100 KSI)
	OR
	5/16" DIA. ULTRACON BY EL (Fu=177 KSI, Fy=155 KSI)
B	5/16" DIA. ULTRACON BY EL (Fu=177 KSI, Fy=155 KSI)
	5/16" DIA. SELF-DRILLING SCREWS (GRADE 5)
	1/4" DIA. TAPCON BY ITW

10/12/2017 11:38 PM
C:\Users\fbcc\2017 (6th edition)\code change\week 2 - (aug. 4th)\documents\dwgs\14218.4\ytkk164.yhs 50 ft og w3.dwg
14218.4\ytkk164.yhs 50 ft og w3.dwg



F 17 VERTICAL SECTION
HEAD - CONCRETE/MASONRY W/ 1X BUCK
HEAVY CONFIGURATION



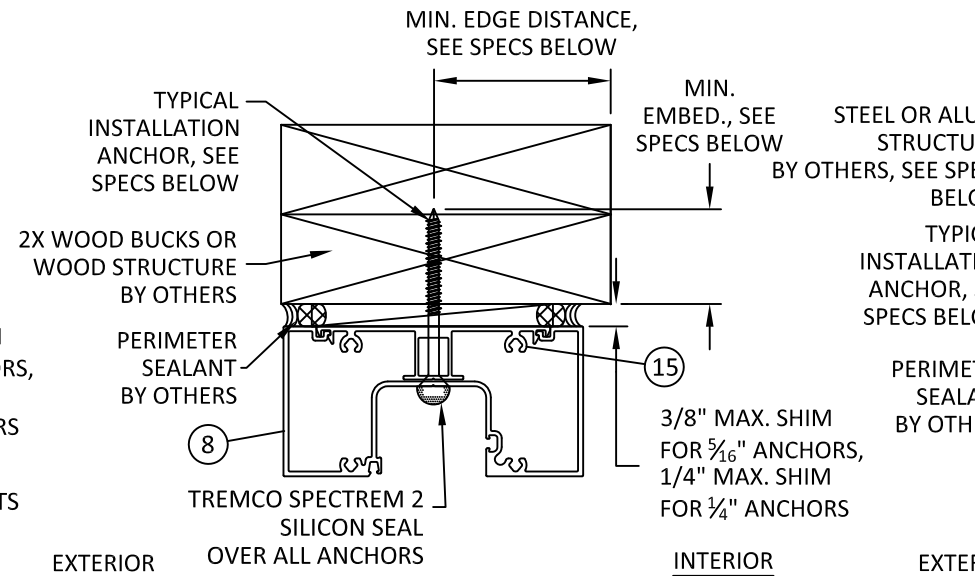
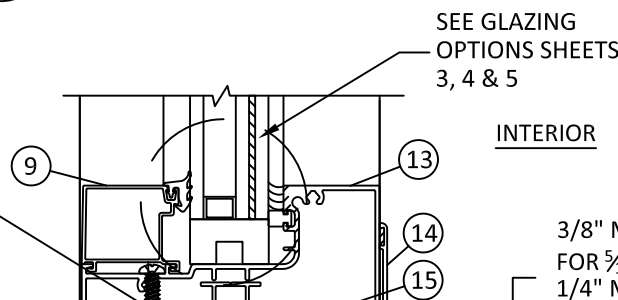
G 17 VERTICAL SECTION
HORIZONTAL MEMBER

O.A.
FRAME
HEIGHT

O.A.
FRAME
HEIGHT

EXTERIOR
TREMCO SPECTREM 2
SILICON SEAL
OVER ALL ANCHORS

3/8" DIA WEEPS TWO PER

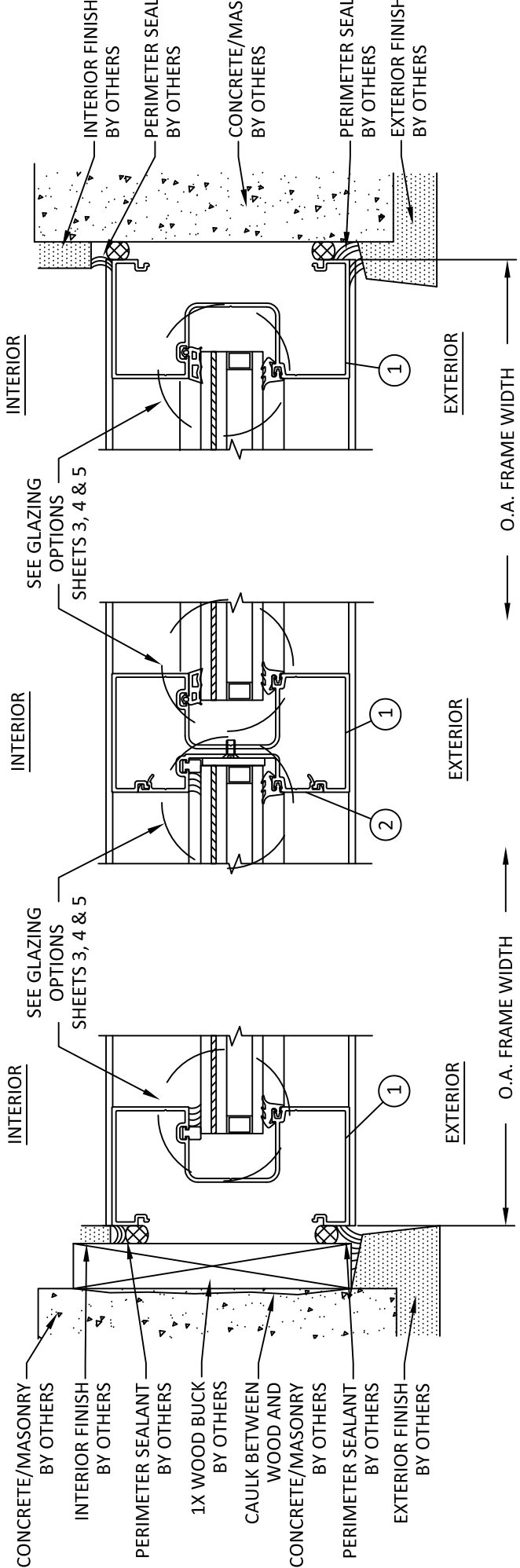


I 17 VERTICAL SECTION
HEAD - WOOD FRAMING
TYPICAL INSTALLATION

LIMIT DESIGN LOADS FOR HORIZONTAL AS FOLLOWS		
MAX HORIZ. SPAN	MAX GLASS HEIGHT ABOVE HORIZ.	MAX DESIGN LOADS
60"	57-1/2"	70 PSF
60"	84"	52 PSF
66"	55-15/16"	44 PSF
66"	84"	32 PSF
72"	55-15/16"	30 PSF
72"	84"	20 PSF

DESIGN LOADS SHOWN ABOVE ARE BASED ON MAX. GLASS AREA ABOVE HORIZONTAL, FOR SIZES SMALLER THAN SHOWN ABOVE, ALLOWABLE DESIGN LOADS MAY BE CALCULATED SEPARATELY.

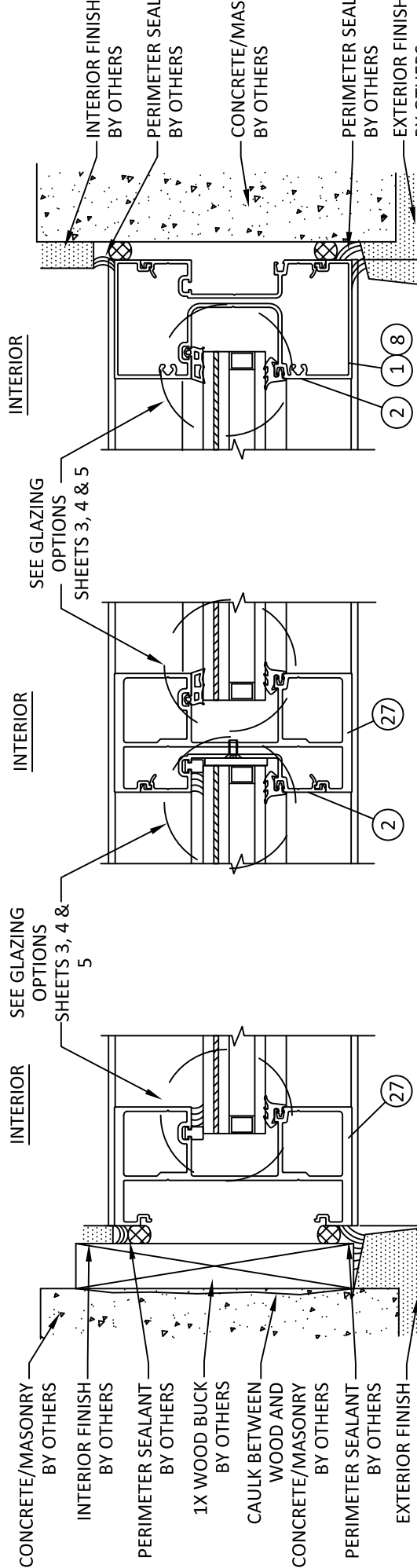
YH	
ANCHOR TYPE	ANCHOR DESCRIPTION
A	5/16" DIA. TAPCON BY ITW (Fu=125 KSI, Fy=100 KSI)
	OR
	5/16" DIA. ULTRACON BY ELO (Fu=177 KSI, Fy=155 KSI)
B	5/16" DIA. ULTRACON BY ELO (Fu=177 KSI, Fy=155 KSI)
	5/16" DIA. SELF-DRILLING SCREWS (GRADE 5)
	1/4" DIA. TAPCON BY ITW (Fu=125 KSI, Fy=100 KSI) OR

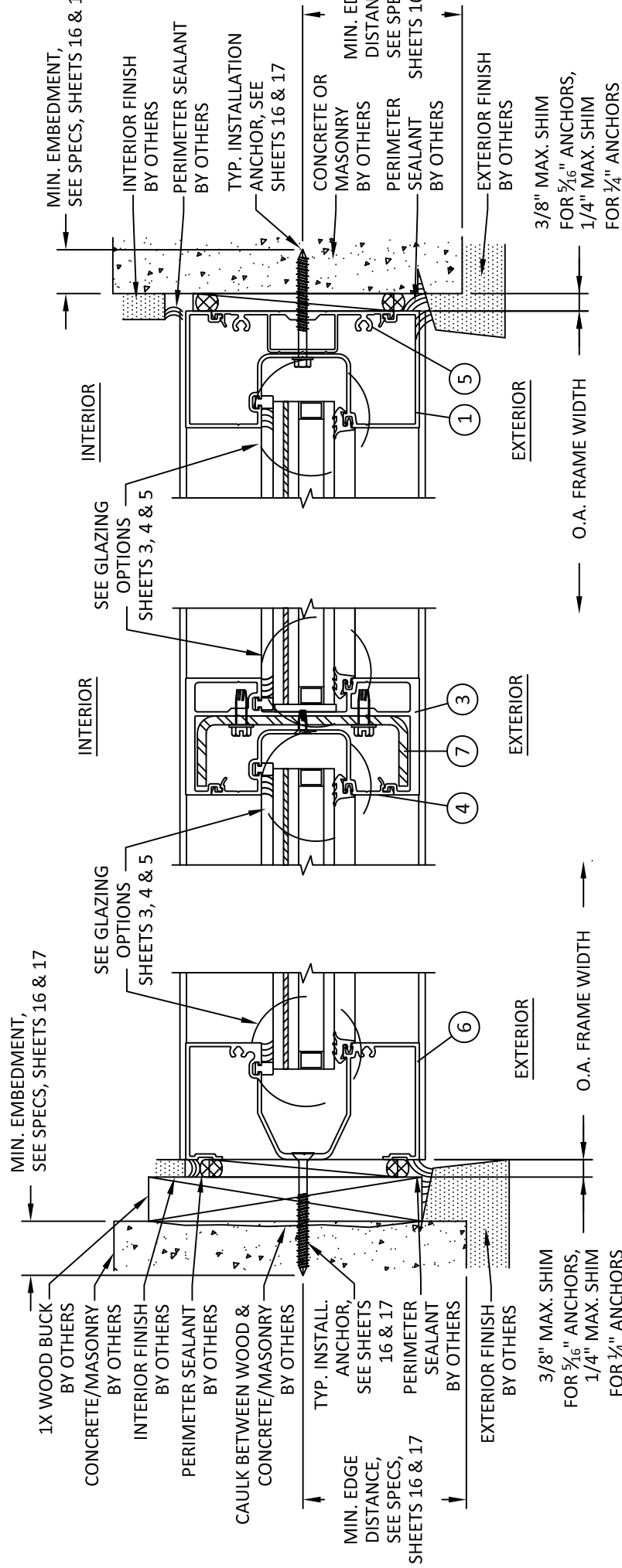


L HORIZONTAL SECTION
18 JAMB - CONCRETE/MASONRY W/ 1X BUCK
LIGHT CONFIGURATION

M HORIZONTAL SECTION
18 VERTICAL MULLION
LIGHT CONFIGURATION

N HORIZONTAL SECTION
18 JAMB - DIRECT TO CONCRETE/MASONRY
LIGHT CONFIGURATION





S HORIZONTAL SECTION

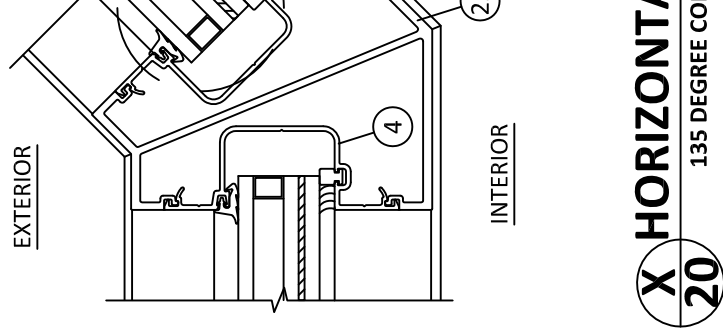
19 JAMB - CONCRETE/MASONRY W/ 1X BUCK
HEAVY CONFIGURATION

T HORIZONTAL SECTION

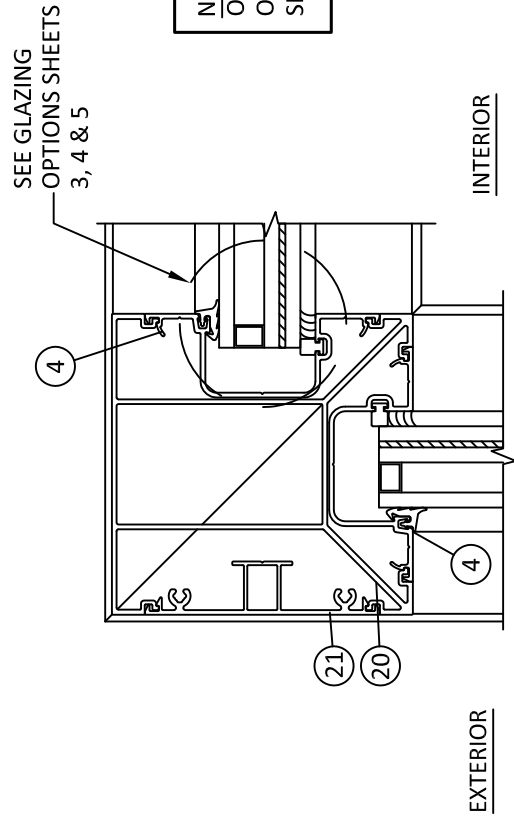
19 VERTICAL MULLION
HEAVY CONFIGURATION

U HORIZONTAL SECTION

19 JAMB - DIRECT TO CONCRETE/MASONRY
HEAVY CONFIGURATION



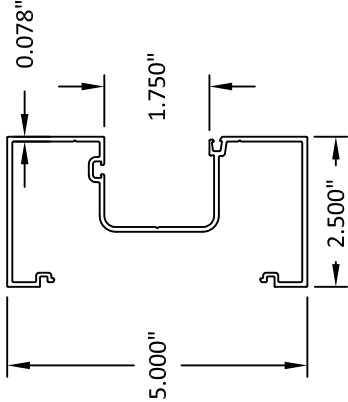
X HORIZONTAL
20 135 DEGREE CO



NOTE: CORNER MULLIONS MAY BE ORIENTED TO EXTERIOR (AS SHOWN ON 90° DETAIL) OR TO INTERIOR (AS SHOWN ON 135° DETAIL).

W HORIZONTAL SECTION
20 90 DEGREE CORNER MULLION

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL
1	E9-0663	LIGHT MULLION/JAMB & HEAVY JAMB	6063-T5
2	E9-0655	SHALLOW POCKET FILLER	6063-T5
3	E9-0665	HEAVY MULLION	6063-T5
4	E9-0656	DEEP POCKET FILLER	6063-T5
5	E9-0614	FLUSH FILLER	6063-T5
6	E9-0662	LIGHT HEAD OR HEAVY JAMB	6063-T5
7	E1-1062	HEAVY MULLION REINFORCEMENT	STEEL
8	E9-0651	HEAVY HEAD / MEDIUM JAMB	6063-T5
9	E9-0658	GLASS STOP	6063-T5
10	E9-0653	HORIZONTAL MEMBER	6063-T5
11	E9-0664	LIGHT SILL	6063-T5
12	E9-0625	LIGHT SILL FLASHING	6063-T5
13	E9-0652	HEAVY SILL	6063-T5
14	E9-0619	HEAVY SILL FLASHING	6063-T5
15	E9-0657	SNAP IN COVER	6063-T5
16	E9-0504	DOOR MULLION	6063-T5
17	E9-0688	FEMALE EXPANSION MULLION	6063-T5
18	E9-0689	MALE EXPANSION MULLION	6063-T5
19	--	EXPANSION MULLION REINFORCEMENT	STEEL
20	E9-0659	90 DEGREE CORNER MULLION	6063-T5
21	E9-0657	90 DEGREE CORNER MULLION FILLER	6063-T5
22	E9-0660	135 DEGREE CORNER MULLION	6063-T5
23	E2-0084	INTERIOR GLAZING SPACER	PC EPDM
24	E2-0095	SETTING BLOCK	EPDM
25	E2-0088	INTERIOR GLAZING GASKET	EPDM
26	E2-0083	EXTERIOR GLAZING GASKET	EPDM
27	E9-0654	MEDIUM MULLION / JAMB	6063-T5



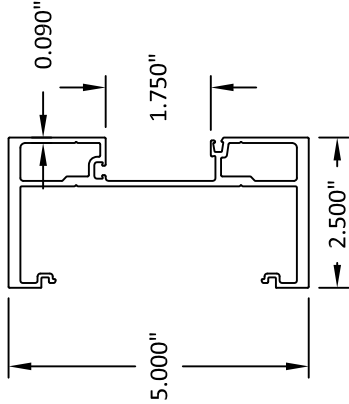
1 LIGHT MULLION/JAMB & HEAVY JAMB
6063-T5

1

2

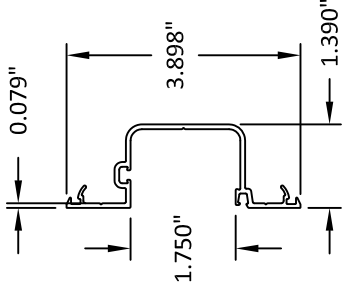
3

6



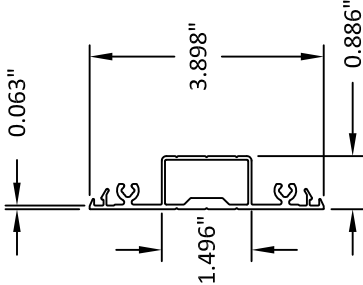
3 HEAVY MULLION
6063-T5

3



4 DEEP POCKET FILLER
6063-T5

4

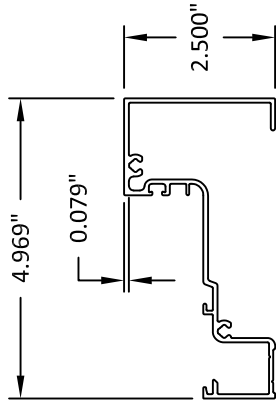


5 FLUSH FILLER
6063-T5

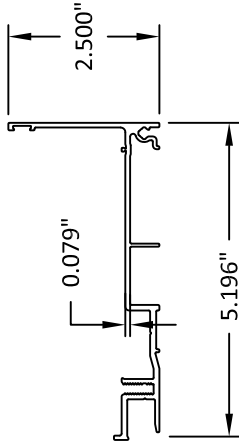
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6

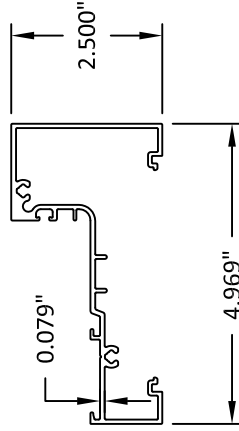
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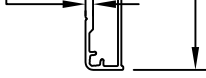
11 LIGHT SILL
6063-T5



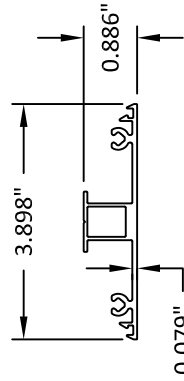
12 LIGHT SILL FLASHING
6063-T5



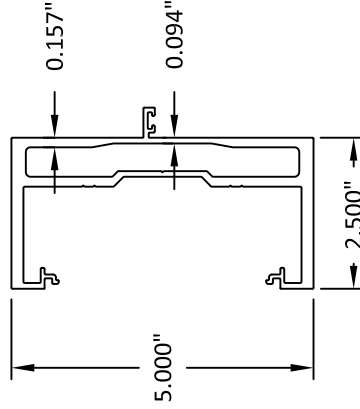
13 HEAVY SILL
6063-T5



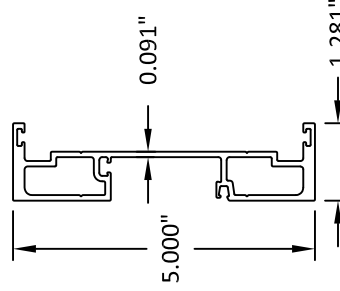
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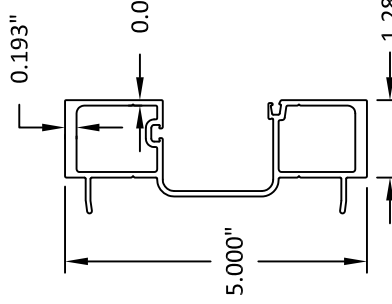
15 SNAP IN COVER
6063-T5



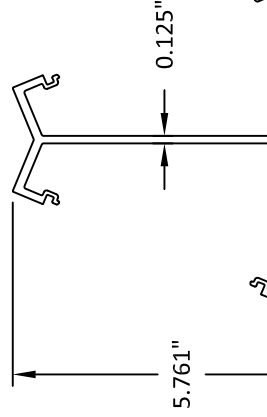
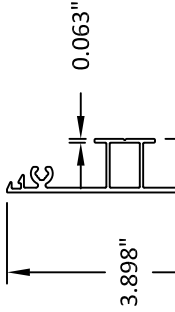
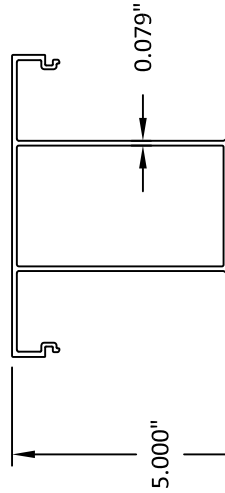
16 DOOR MULLION
6063-T5



17 FEMALE EXPANSION MULLION
6063-T5



18 MALE EXPANSION MULLION
6063-T5



INSTALLATION NOTES:

- ONE (1) INSTALLATION ANCHOR IS REQUIRED AT EACH ANCHOR LOCATION SHOWN.
- THE NUMBER OF INSTALLATION ANCHORS DEPICTED IS THE MINIMUM NUMBER OF ANCHORS TO BE USED FOR PRODUCT INSTALLATION.
- INSTALL INDIVIDUAL INSTALLATION ANCHORS WITHIN A TOLERANCE OF ±1/2 INCH OF THE DEPICTED LOCATION IN THE ANCHOR LAYOUT DETAIL (I.E., WITHOUT CONSIDERATION OF TOLERANCES). TOLERANCES ARE NOT CUMULATIVE FROM ONE INSTALLATION ANCHOR TO THE NEXT.
- SHIM AS REQUIRED AT EACH INSTALLATION ANCHOR WITH LOAD BEARING SHIM(S). MAXIMUM ALLOWABLE SHIM STACK TO BE 3/8 INCH. SHIM WHERE SPACE OF 1/16 INCH OR GREATER OCCURS. SHIM(S) SHALL BE CONSTRUCTED OF HIGH DENSITY PLASTIC OR BETTER.
- FOR INSTALLATION INTO WOOD FRAMING USE #14 WOOD SCREWS OF SUFFICIENT LENGTH TO ACHIEVE 1 1/2 INCH MINIMUM EMBEDMENT INTO WOOD SUBSTRATE.
- FOR INSTALLATION THROUGH 1X BUCK TO CONCRETE/MASONRY, OR DIRECTLY INTO CONCRETE/MASONRY, USE 1/4 INCH DIAMETER ITW TAPCONS OF SUFFICIENT LENGTH TO ACHIEVE 1 1/4 INCH MINIMUM EMBEDMENT.
- FOR INSTALLATION THROUGH METAL FRAME USE 1/4 INCH DIAMETER SELF-TAPPING SCREW OF SUFFICIENT LENGTH TO ACHIEVE 3 THREADS MINIMUM PENETRATION BEYOND METAL FRAME SUBSTRATE.
- FOR INSTALLATION THROUGH ALUMINUM MULLION USE 1/4 INCH DIAMETER SELF-TAPPING SCREW OF SUFFICIENT LENGTH TO ACHIEVE 3 THREADS MINIMUM PENETRATION BEYOND ALUMINUM FRAME SUBSTRATE.
- MINIMUM EMBEDMENT AND EDGE DISTANCE EXCLUDE WALL FINISHES, INCLUDING BUT NOT LIMITED TO STUCCO, FOAM, BRICK VENEER, AND SIDING.
- INSTALLATION ANCHORS AND ASSOCIATED HARDWARE MUST BE MADE OF CORROSION RESISTANT MATERIAL OR HAVE A CORROSION RESISTANT COATING.
- FOR HOLLOW BLOCK AND GROUT FILLED BLOCK, DO NOT INSTALL INSTALLATION ANCHORS INTO MORTAR JOINTS. EDGE DISTANCE IS MEASURED FROM FREE EDGE OF BLOCK OR EDGE OF MORTAR JOINT INTO FACE SHELL OF BLOCK.
- INSTALLATION ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND ANCHORS SHALL NOT BE USED IN SUBSTRATES WITH STRENGTHS LESS THAN THE MINIMUM STRENGTH SPECIFIED BY THE MANUFACTURER.

YKK AP AMERICA

SERIES 50HL (NON-F

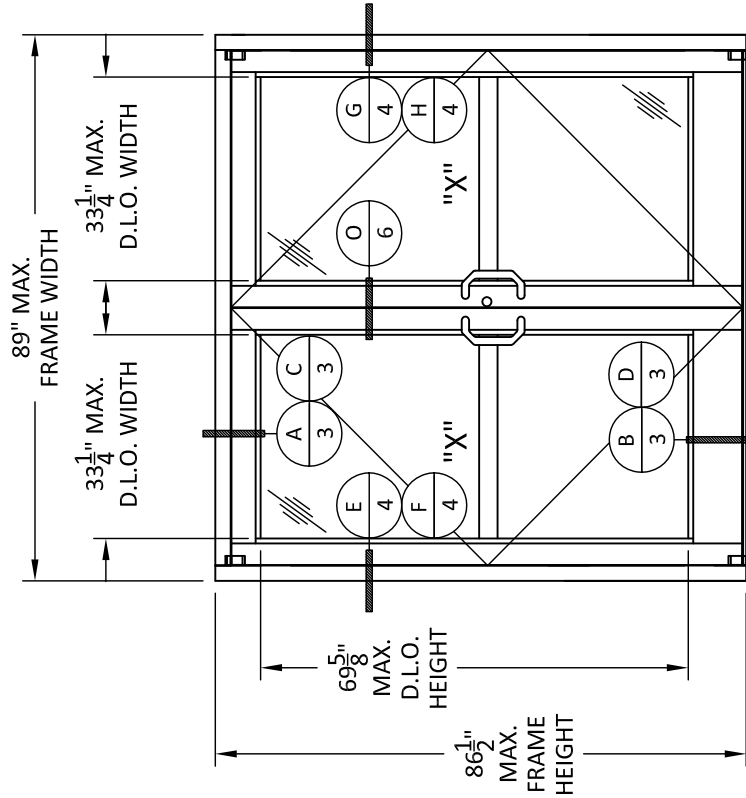
LOW PRESSURE OUTSWING EN

GENERAL NOTES:

- THE PRODUCT SHOWN HEREIN IS DESIGNED AND MANUFACTURED TO COMPLY WITH THE 6TH EDITION (2017) FLORIDA BUILDING CODE (FBC), EXCLUDING HVHZ AND HAS BEEN EVALUATED ACCORDING TO THE FOLLOWING:
 - TAS 202-94
 - ASTM E1886-05
 - ASTM E1996-06
- ADEQUACY OF THE EXISTING STRUCTURAL CONCRETE/MASONRY, 2X FRAMING AND METAL STUD FRAMING AS A MAIN WIND FORCE RESISTING SYSTEM CAPABLE OF WITHSTANDING AND TRANSFERRING APPLIED PRODUCT LOADS TO THE FOUNDATION IS THE RESPONSIBILITY OF THE ENGINEER OR ARCHITECT OF RECORD FOR THE PROJECT OF INSTALLATION.
- 1X AND 2X BUCKS (WHEN USED) SHALL BE DESIGNED AND ANCHORED TO PROPERLY TRANSFER ALL LOADS TO THE STRUCTURE. BUCK DESIGN AND INSTALLATION IS THE RESPONSIBILITY OF THE ENGINEER OR ARCHITECT OF RECORD FOR THE PROJECT OF INSTALLATION.
- THE INSTALLATION DETAILS DESCRIBED HEREIN ARE GENERIC AND MAY NOT REFLECT ACTUAL CONDITIONS FOR A SPECIFIC SITE. IF SITE CONDITIONS CAUSE INSTALLATION TO DEVIATE FROM THE REQUIREMENTS DETAILED HEREIN, A LICENSED ENGINEER OR ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS FOR USE WITH THIS DOCUMENT.
- APPROVED IMPACT PROTECTIVE SYSTEM **IS NOT REQUIRED** ON THIS PRODUCT IN AREAS REQUIRING IMPACT RESISTANCE IN WIND ZONES 3 OR LESS.
- DOOR FRAME MATERIAL: ALUMINUM 6063-T5
- ALL STRUCTURAL MATERIALS & DISSIMILAR METALS SHALL BE PROTECTED, TREATED, PAINTED, COATED, AND/OR ISOLATED AS REQUIRED IN THE APPLICABLE SECTIONS OF THE CURRENT FLORIDA BUILDING CODE AND REFERENCED DESIGN SPECIFICATIONS.
- CLASS MEETS THE REQUIREMENTS OF ASTM E 1200 04 CLASS

SHEET	REV.
1	C
2	A
3	A
4	B
5	A
6	A
7	A
8	B
9	B
10	-
11	-
CON	

DES	
GLAZING TYPES	MAX
A, B, E, F, I, J, K, L	41 13
C, D, G, H	41 13

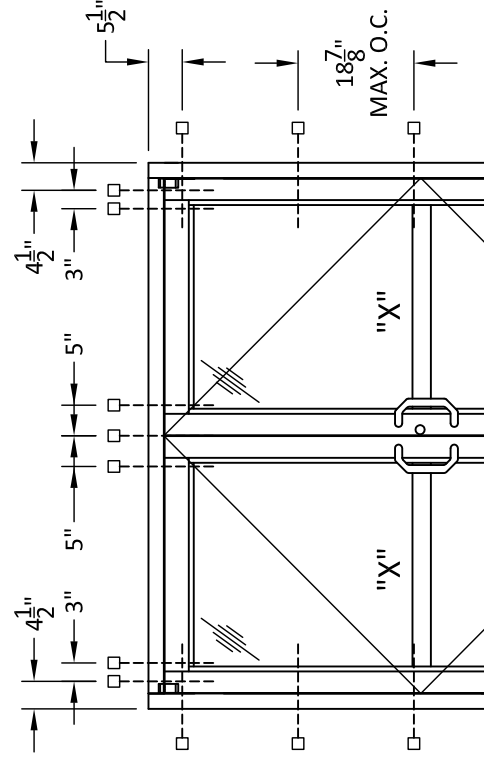


ELEVATION A
DOUBLE DOOR

HINGES QUALIFIED:		
DP RATING	IMPACT RATING	HARDWARE
+/- 50 PSF	LARGE MISSILE	- STANDARD BUTT HINGES - STANDARD OFFSET PIVOTS - ROTON 780-224HD CONTINUOUS GEARED HINGE
+/- 50 PSF	SMALL MISSILE	- STANDARD BUTT HINGES - STANDARD OFFSET PIVOTS - ROTON 780-224HD CONTINUOUS GEARED HINGE

LOCKS QUALIFIED:		
DP RATING	IMPACT RATING	HARDWARE
+/- 50 PSF	LARGE MISSILE	- MS 1850 HOOK LOCK W/ FLUSHBOLTS FOR INACTIVE LEAF - FIRST CHOICE 3690 CVR EXIT DEVICE
+/- 50 PSF	SMALL MISSILE	- MS 1850 HOOK LOCK W/ FLUSHBOLTS FOR INACTIVE LEAF - FIRST CHOICE 3690 CVR EXIT DEVICE

(SIDELITE UNDER SEPERATE APPROVAL)



NOTES:

1. SINGLE DOORS WITH ANY COMBINATION OF TRANSOM AND/OR SIDELITE SHOWN ARE ALSO QUALIFIED.
2. SINGLE AND DOUBLE DOORS ARE QUALIFIED SUCH THAT SINGLE DOOR UTILIZES THE HARDWARE FROM ACTIVE DOOR PANEL.

1/2" MIN. EDGE DISTANCE

MIN. 6063-T5 ALUMINUM
MULLION OR CURTAINWALL
FRAME UNDER SEPARATE
APPROVAL

1/4" SELF-TAPPING
SCREW

3 THREADS OF MIN.
PENETRATION BEYOND
ALUMINUM STRUCTURE

3/8" MAX.
SHIM SPACE

NOTE:
GLASS STOP RETAINER (ITEM #11) IS TO
BE SPACED 3" FROM CORNERS AND 14
7/16" MAX. O.C. THEREAFTER.

O.A.
UNIT
HEIGHT

EXTERIOR

INTERIOR

SEE GLAZING
DETAILS A, B, C, D, I, K

VERTICAL SECTION A

DOOR HEAD - ALUMINUM MULLION

SEE GLAZING
DETAILS A, B, C, D, I, K

EXTERIOR

O.A.
UNIT
HEIGHT

INTERIOR

1/2" MIN. EDGE DISTANCE

MIN. 18 GA. STEEL
STUD BY OTHERS
SHEATHING
BY OTHERS
EXTERIOR FINISH
BY OTHERS

PERIMETER SEALANT
BY OTHERS

O.A.
UNIT
HEIGHT

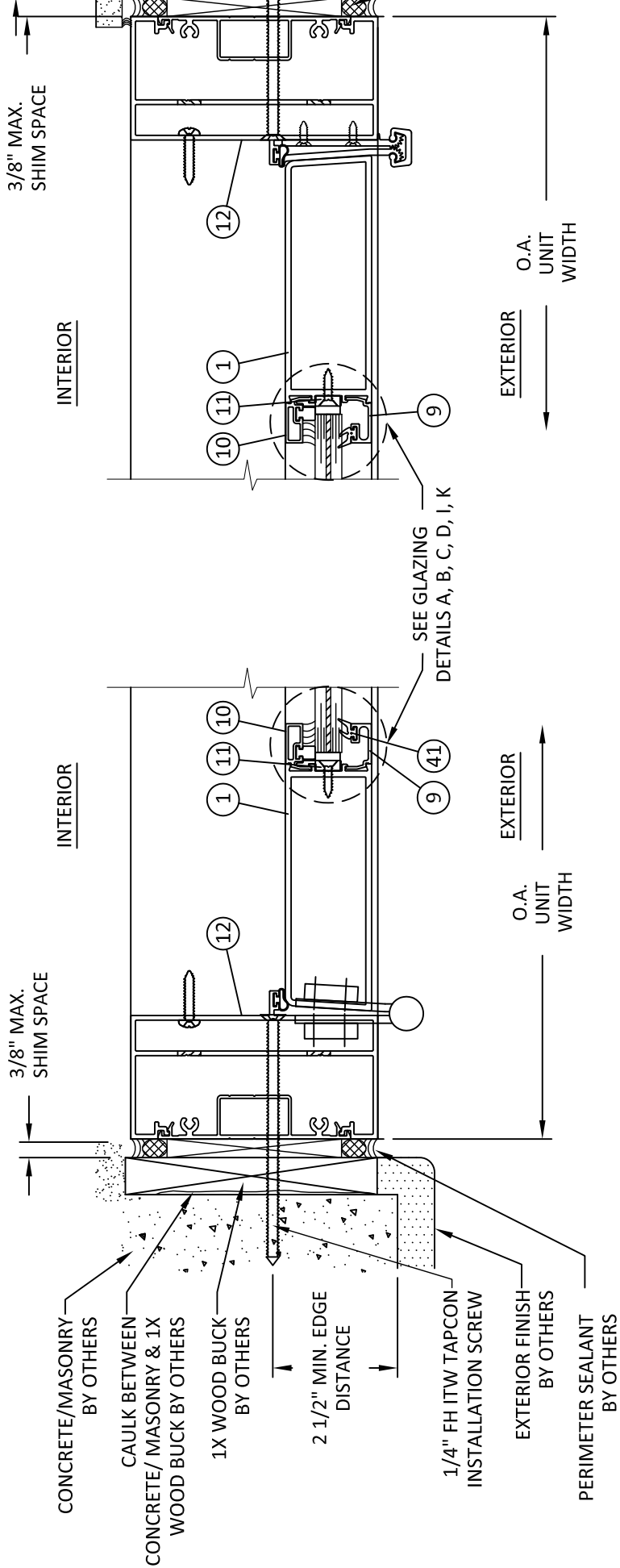
EXTERIOR

VERTICAL SECTION C

DOOR HEAD - S

EXTERIOR

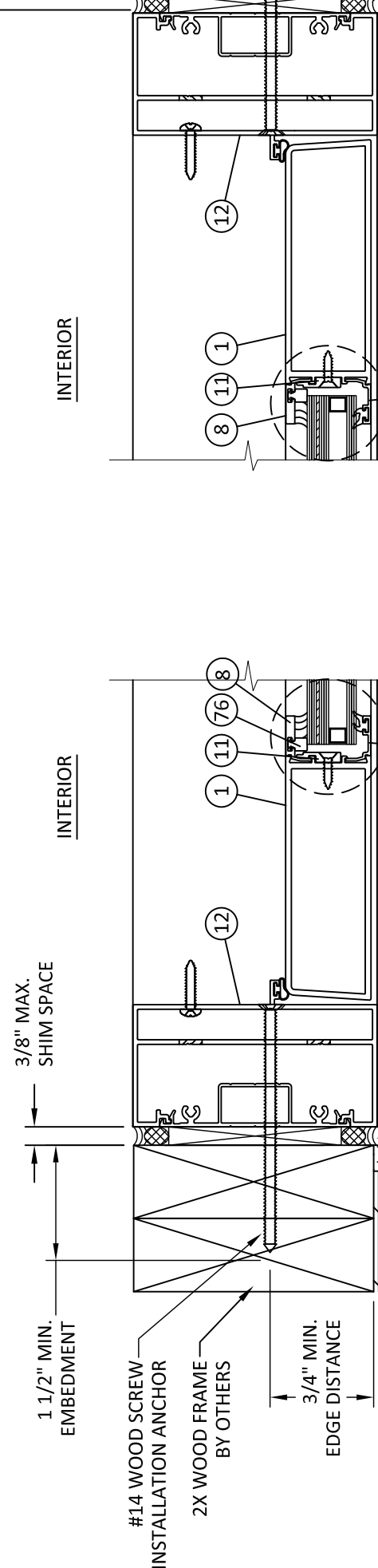
O.A.
UNIT
HEIGHT

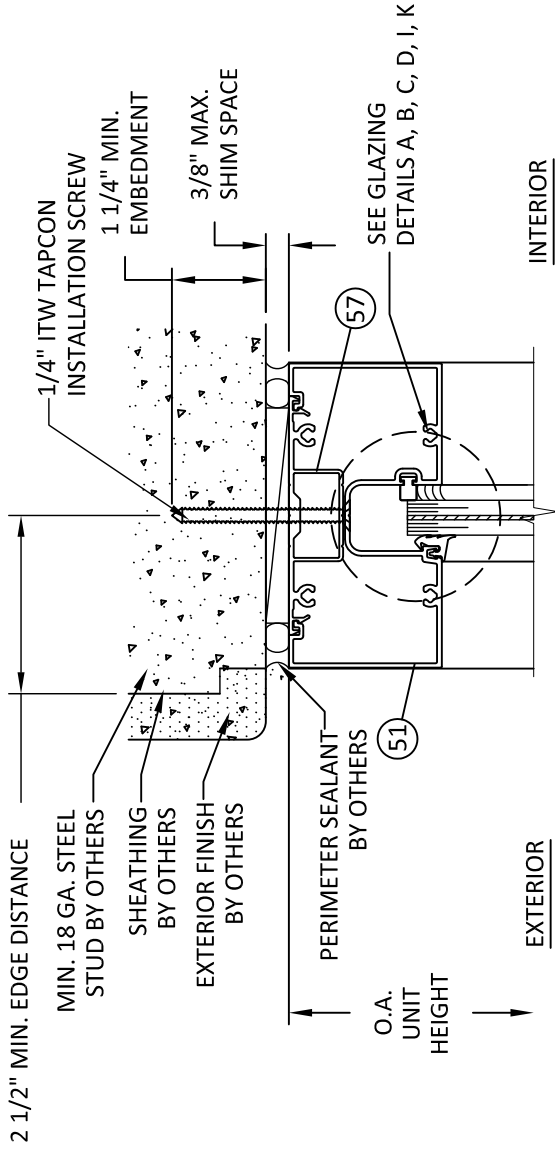


E **HORIZONTAL SECTION**
4 DOOR JAMB - CONCRETE/MASONRY
 STANDARD BUTT HINGE

G **HORIZONTAL SECTION**
4 DOOR JAMB - ROTON CO

NOTE:
 GLASS STOP RETAINER (ITEM #11) IS TO
 BE SPACED 3" FROM CORNERS AND 22"
 MAX. O.C. THEREAFTER.

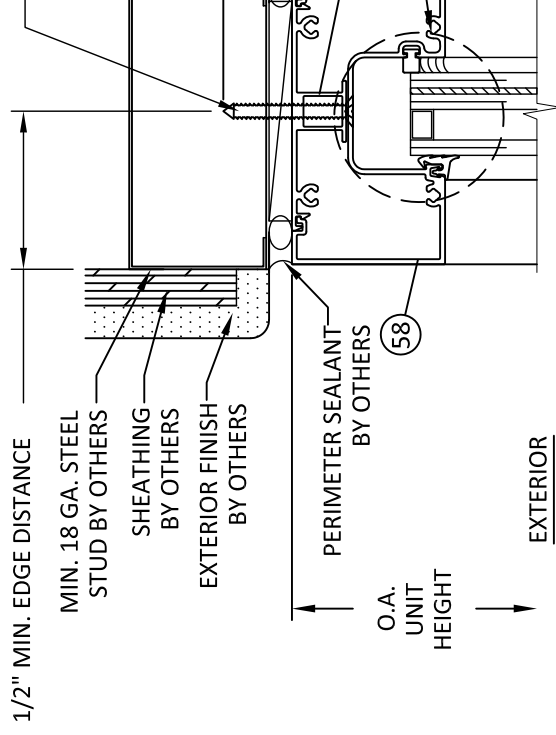
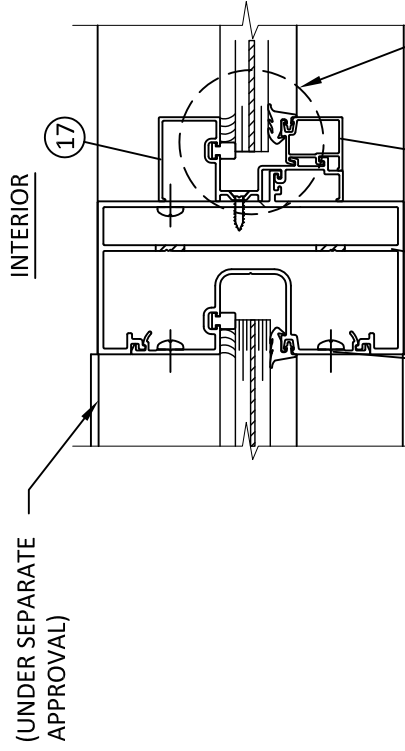




VERTICAL SECTION

TRANSOM HEAD - CONCRETE/MASONRY

I
5



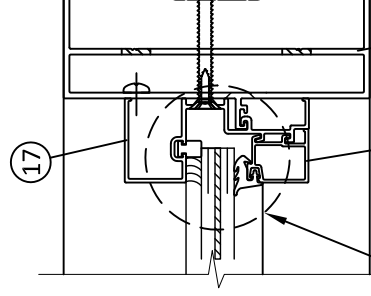
VERTICALS

TRANSOM HEAD - S

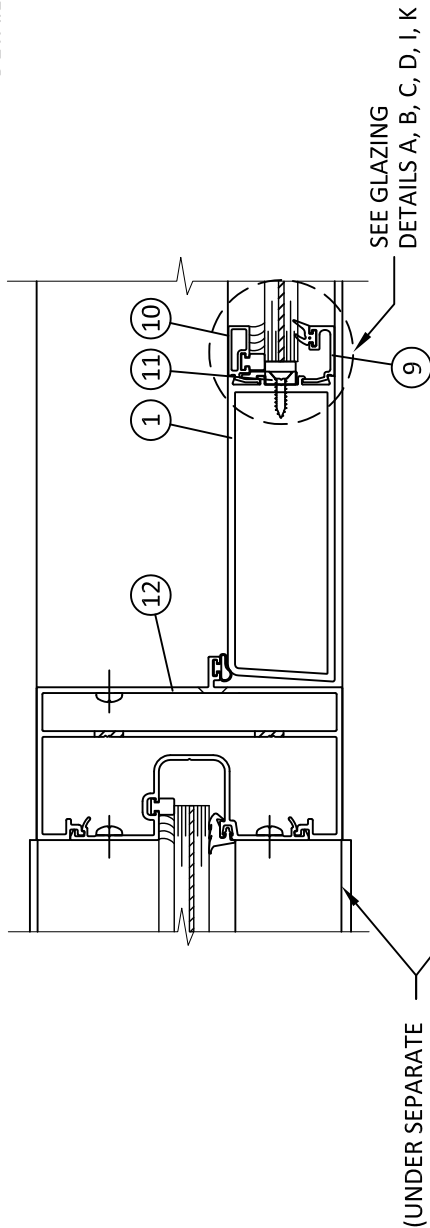
K
5

3/8" MAX.
SHIM SPACE

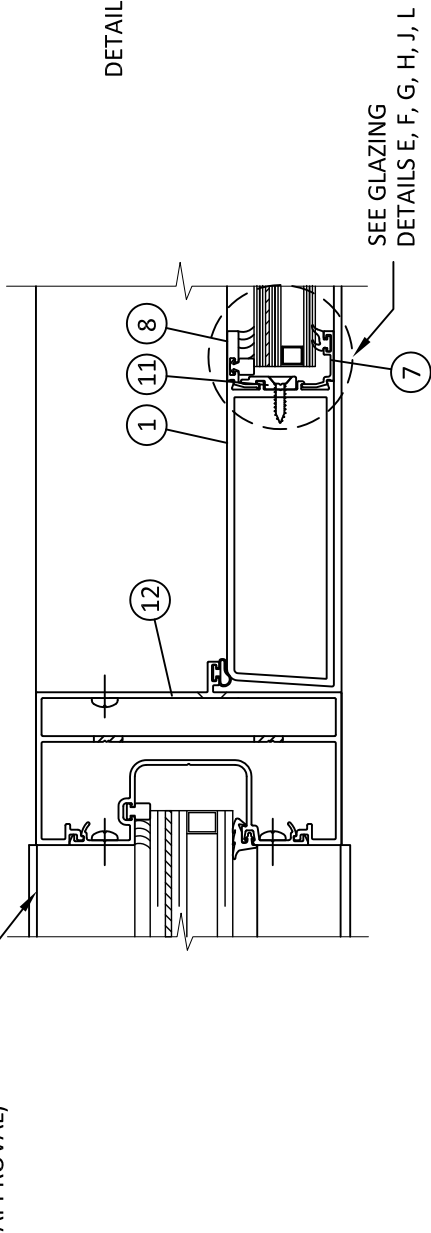
INTERIOR



SEE GLAZING
DETAILS A, B, C, D, I, K



SEE GLAZING
DETAILS E, F, G, H, J, L



M HORIZONTAL SECTION

DOOR JAMB MULLIED TO SIDELITE

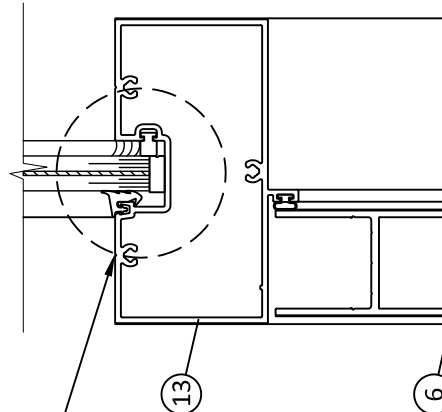
6

O HORIZONTAL SECTION

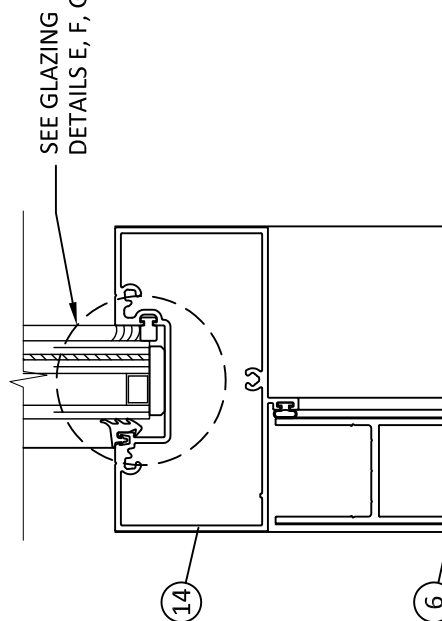
MEETING S

6

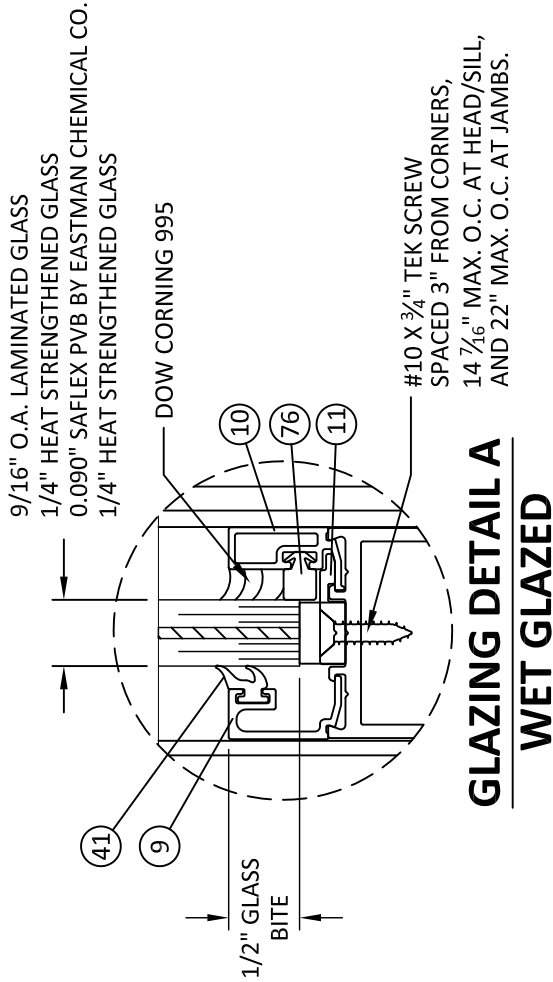
SEE GLAZING
DETAILS A, B, C, D, I, K



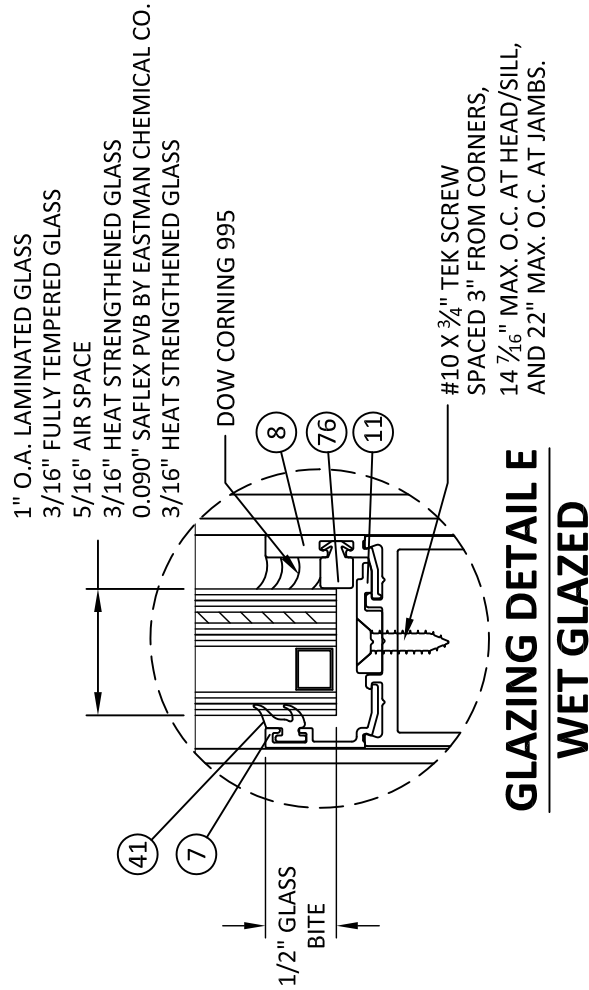
SEE GLAZING
DETAILS E, F, G, H, J, L



LARGE & SMALL MISSILE IMPACT

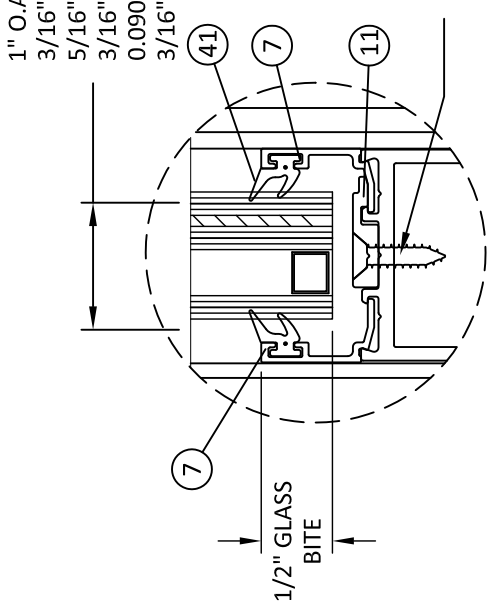


GLAZING DETAIL B
WET GLAZED

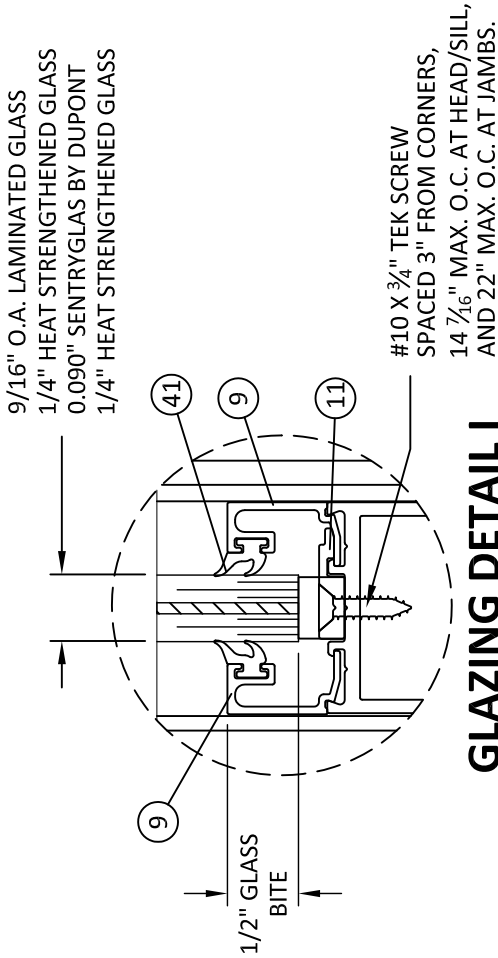


GLAZING DETAIL F
WET GLAZED

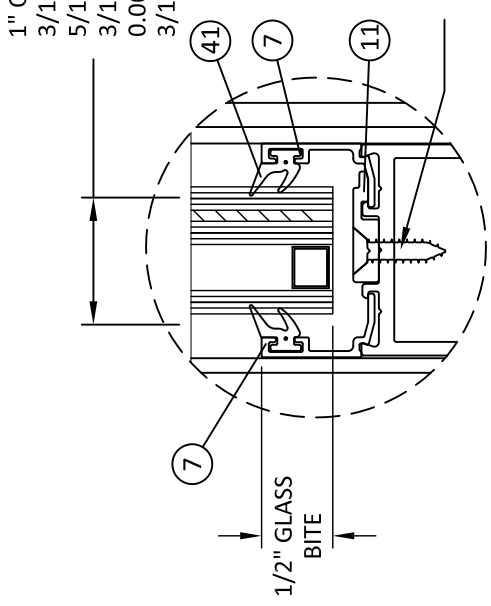
LARGE & SMALL MISSILE IMPACT



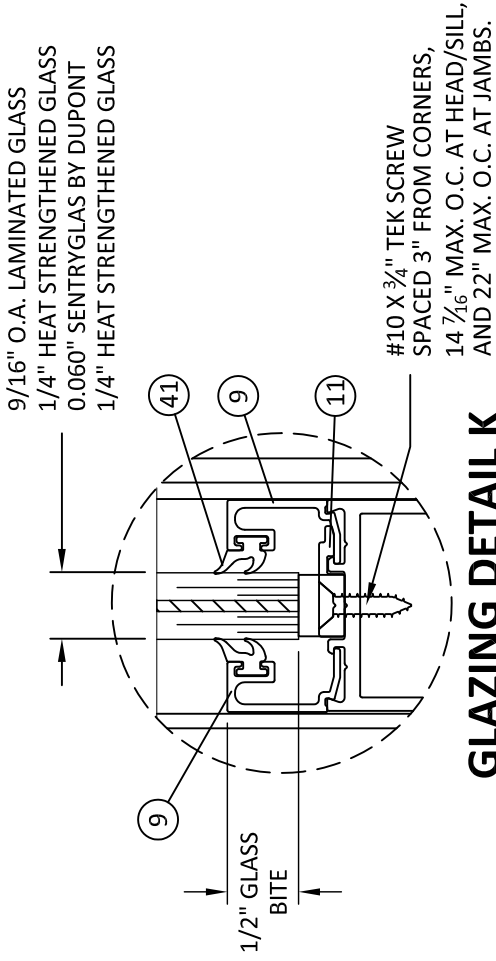
GLAZING DETAIL J
DRY GLAZED



GLAZING DETAIL I
DRY GLAZED

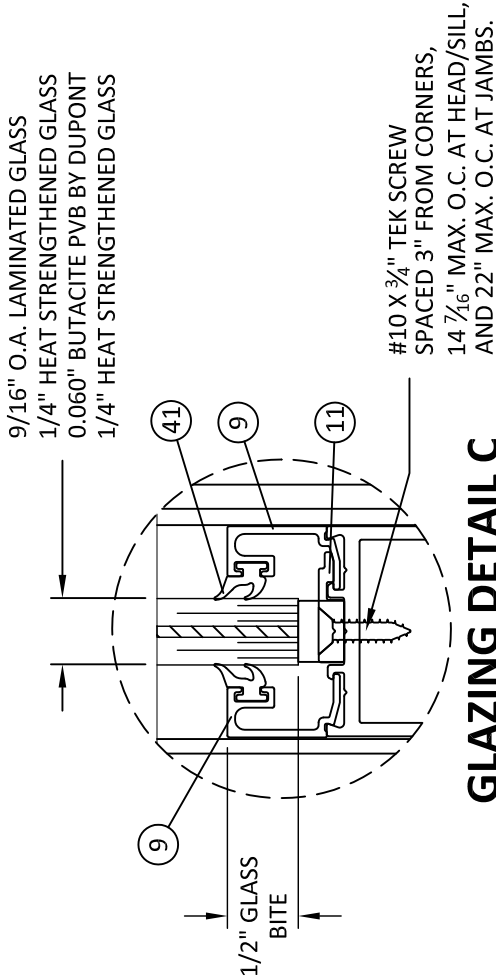


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DRY GLAZED

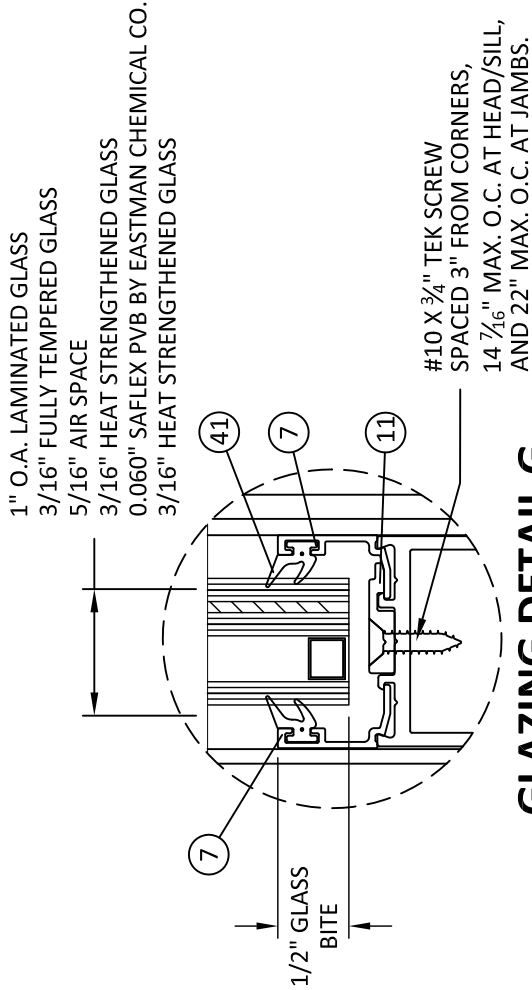
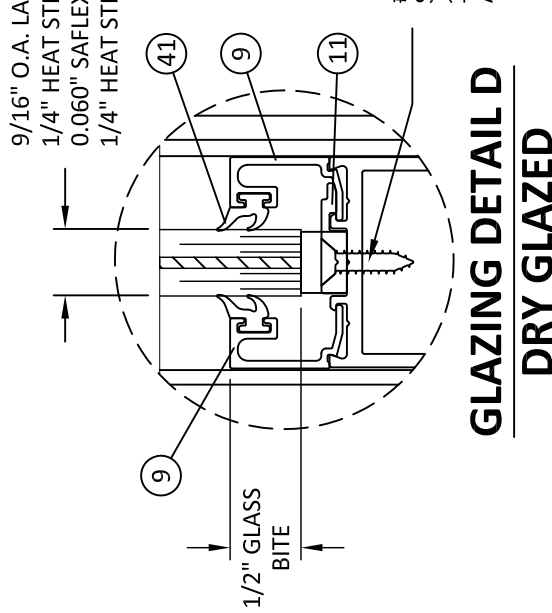


GLAZING DETAIL K
DRY GLAZED

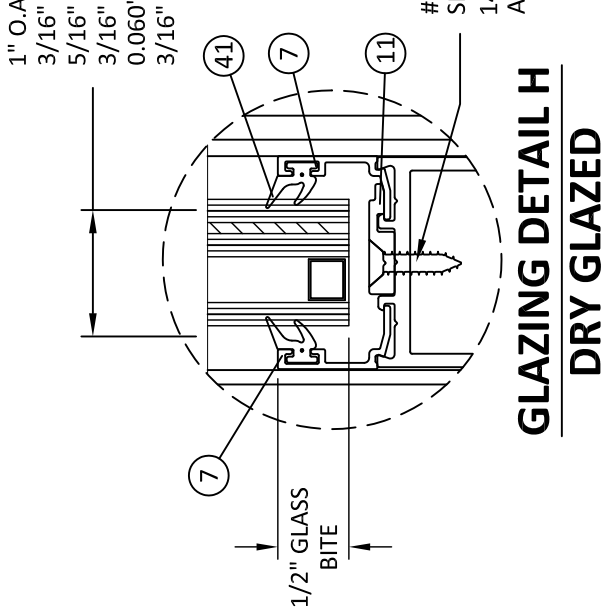
SMALL MISSILE IMPACT ONLY



GLAZING DETAIL C
DRY GLAZED



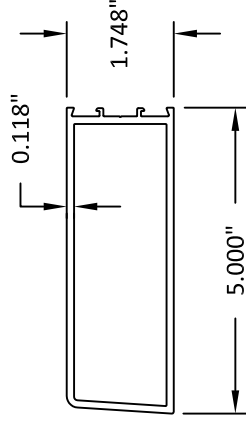
GLAZING DETAIL G
DRY GLAZED



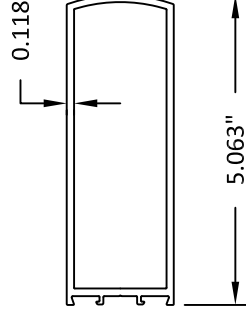
50HL DOOR BILL OF MATERIALS

ITEM #	PART #	DESCRIPTION	MATERIAL	MANUFACTURER
1	E9-0311	PIVOT STILE	6063-T5	YKK AP
2	E9-0313	MEETING STILE	6063-T5	YKK AP
3	E9-0331	MEETING STILE	6063-T5	YKK AP
4	E9-0332	MEETING STILE COVER	6063-T5	YKK AP
5	E9-0317	8" BOTTOM RAIL	6063-T5	YKK AP
6	E9-0334	TOP RAIL	6063-T5	YKK AP
7	E9-0203	EXTERIOR GLASS STOP 1"	6063-T5	YKK AP
8	E9-0204	INTERIOR GLASS STOP 1"	6063-T5	YKK AP
9	E9-0201	EXTERIOR GLASS STOP 9/16"	6063-T5	YKK AP
10	E9-0202	INTERIOR GLASS STOP 9/16"	6063-T5	YKK AP
11	E9-0205	GLASS STOP RETAINER	6063-T5	YKK AP
12	E9-0551	DOOR JAMB	6063-T5	YKK AP
13	E9-0552	MONO TRANSOM BAR	6063-T5	YKK AP
14	E9-0553	INSULATING TRANSOM BAR	6063-T5	YKK AP
15	E9-0407	4" THRESHOLD	6063-T5	YKK AP
16	E9-0427	THRESHOLD ATTACHMENT	6063-T5	YKK AP
17	E9-0554	MONO TRANSOM ADAPTOR	6063-T5	YKK AP
18	E9-0555	I.G. TRANSOM ADAPTOR	6063-T5	YKK AP
19	E9-0506	TRANSOM GLASS STOP	6063-T5	YKK AP
21	E9-0316	DOOR SHEAR BLOCK	6063-T5	YKK AP
22	E9-0419	HINGE BACKER	6063-T5	YKK AP
23	E9-0423	THRESHOLD CLIP	6063-T5	YKK AP
24	E1-0324	LOCK BASE	6063-T5	YKK AP
25	E1-0320	HINGE BACK PLATE	6063-T5	YKK AP
26	E1-0311	BACKER PLATE	STEEL	
27	E1-0312	BACKER PLATE	STEEL	
28	E1-0309	JOINT CLIP	6063-T5	YKK AP
29	E1-0310	JOINT CLIP	6063-T5	YKK AP
30	E1-0307	THRESHOLD CLIP	STEEL	
31	E1-0331	FLUSHBOLT		
32	E1-0332	FLUSHBOLT GUIDE		
33	E1-0319	FLUSHBOLT STRIKE		
34	E1-1137	GLASS STOP RETAINER	6063-T5	
35	E1-0300	BOTTOM PIVOT FOR FRAME (R)		
36	E1-0301	BOTTOM PIVOT FOR FRAME (L)		
37	E1-0302	BOTTOM PIVOT FOR DOOR		
38	E1-0303	TOP PIVOT FOR FRAME		
39	E1-0304	TOP PIVOT FOR DOOR		
40	E1-0197	RM REINFORCING	STEEL	
41	E2-0050	AIRTIGHT GASKET	EPDM	
42	E2-0062	WEATHERSTRIP	POLYPROPYLENE	
43	E2-0054	SETTING BLOCK MONO	EPDM	

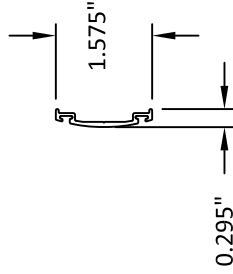
1 PIVOT STILE
6063-T5



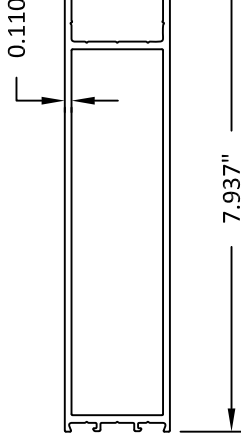
2 MEETING STILE
6063-T5



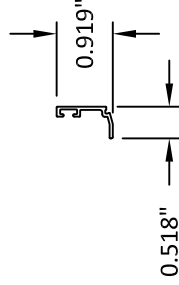
4 MEETING STILE COVER
6063-T5



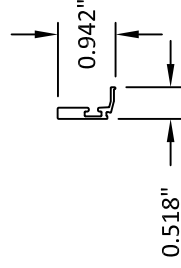
5 8" BOTTOM RAIL
6063-T5



7 EXT. GLASS STOP 1"
6063-T5



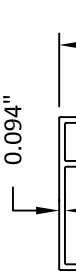
8 INT. GLASS STOP 1"
6063-T5



11 GLASS STOP RETAINER
6063-T5

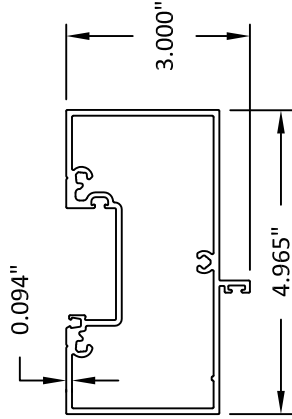


12 DOOR JAMB
6063-T5

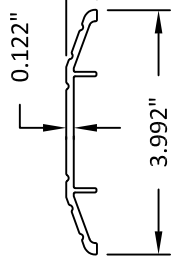


35HL DOOR BILL OF MATERIALS (CONTINUED)				
ITEM #	PART #	DESCRIPTION	MATERIAL	MANUFACTURER
51	E9-0601	HEAD/ JAMB/ MULLION	6063-T5	YKK AP
55	E9-0606	DEEP POCKET FILLER	6063-T5	YKK AP
57	E9-0614	FLUSH FILLER	6063-T5	YKK AP
58	E9-0651	HEAD/ JAMB/ MULLION	6063-T5	YKK AP
63	E9-0657	FLUSH FILLER	6063-T5	YKK AP
65	E1-1068	ANCHOR FILLER	6063-T5	YKK AP
68	E2-0084	INTERIOR SPACER	PC EPDM	
69	E2-0083	EXTERIOR GASKET	EPDM	
70	E2-0088	INTERIOR GASKET (DRY)	EPDM SPONGE	
72	E2-0737	TRANSOM SETTING BLOCK	EPDM	
73	E2-0134	TRANSOM SETTING BLOCK	EPDM	
76	E2-0085	DOOR & REGLAZE SILICONE SPACER		

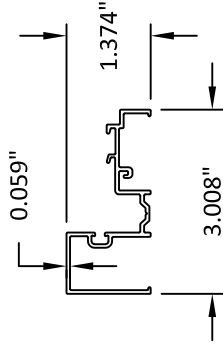
14 INSULATING TRANSOM BAR
6063-T5



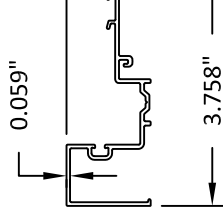
15 4" THRESHOLD
6063-T5



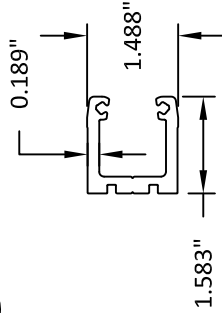
17 MONO TRANSOM ADAPTOR
6063-T5



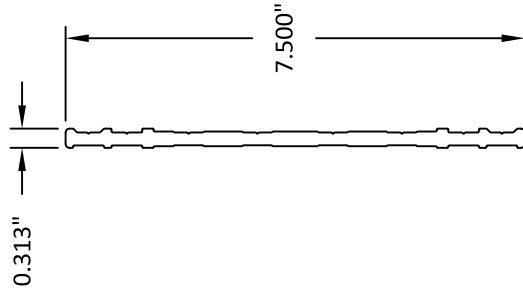
18 I.G. TRANSOM
6063-T5



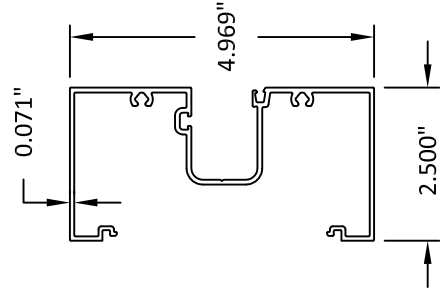
21 DOOR SHEAR BLOCK
6063-T5



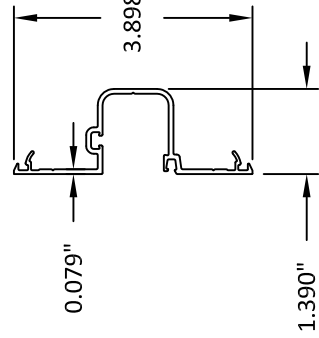
22 HINGE BACKER
6063-T5



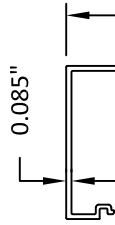
51 HEAD/JAMB/MULLION
6063-T5



55 DEEP POCKET
6063-T5



58 HEAD/JAMB/MULLION
6063-T5



**SECTION 08 5013
GLAZED INTEGRAL BLIND UNITS**

PART 1 -GENERAL

1.1 SECTION INCLUDES

- A. Sealed glazed integral louver systems for installation in hollow metal and door vision frames.
- B. Manual operators.

1.2 RELATED REQUIREMENTS

- A. Section 08 1113 - Hollow Metal Doors and Frames: Installation in hollow metal frames.
- B. Section 08 1423 - Laminate-Faced Flush Wood Doors: Installation in wood doors.

1.3 ACTION SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions for individual components, and finishes.
- C. Shop Drawings: For sealed integral louver systems. Include fabrication and installation plans, elevations, sections, details, locations of preparation for hardware, hardware mounting heights, and attachments to other work.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For blinds to include in maintenance manuals.
- B. Manufacturer warranties.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that specializes in the installation and fabrication of sealed integral blind and glazing systems.
- B. Source Limitations: Obtain sealed integral blind units from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sealed, glazed units in factory packages, marked with manufacturer and product name, and location of installation using same designations indicated on Drawings.
- B. Do not place units in direct sunlight.
- C. Handle units using corner protectors.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install glazed units until construction and wet and dirty finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where glazed units are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop

Drawings. Allow clearances for blind hardware. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of sealed glazed units that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Faulty operation of hardware.
 2. Warranty Period: One year from date of Substantial Completion.

PART 2 -PRODUCTS

2.1 PRODUCTS:

- A. Subject to compliance with requirements, provide products by [<>] the following:
1. Unice! Architectural Corporation; Vision Control Mini and Vision Control General : www.unice!architectural.com/#sle.
 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Provide Glazed Integral Blind/Louver Units from a single manufacturer.
- C. Glazing Unit: Glazed integral louver units consisting of horizontal louvers between lites of fully tempered, sealed, 1-inch clear glass units including accessories and controls for fully operational blinds/louver.
1. Controls: Single-side, Dual-side, and thumbwheel, design, complying with Americans with Disabilities Act.
 - a. Control Location for Single-side Control: Room side.
 - b. Distance Above Finished Floor: Maximum 48 inches above finished floor to top of control mechanism.
 2. Slat Color: To be selected by Architect from manufacturer's standard colors.

PART 3 -EXECUTION

3.1 INSTALLATION

- A. Install units plumb and centered in openings.
- B. Anchor units rigidly and securely to wall framing.

3.2 ADJUSTING

- A. Adjust blinds to operate smoothly, easily and free of binding or malfunction throughout entire operational range.

3.3 CLEANING

- A. Clean unit surfaces after installation, according to manufacturer recommendations.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 08 7100
DOOR HARDWARE**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. This Section includes the following:
 - 1. Hinges
 - 2. Continuous hinges
 - 3. Pivots
 - 4. Key control system
 - 5. Lock cylinders and keys
 - 6. Lock and latch sets
 - 7. Bolts
 - 8. Exit devices
 - 9. Closers
 - 10. Overhead stops and holders
 - 11. Miscellaneous door control devices
 - 12. Door trim units
 - 13. Protection plates
 - 14. Weatherstripping for exterior doors
 - 15. Sound and smoke seals for interior doors
 - 16. Automatic drop seals (door bottoms)
 - 17. Astragals or meeting seals on pairs of doors
 - 18. Thresholds
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 08 11 13: Hollow Metal Doors and Frames
 - 2. Section 08 14 23: Laminated Plastic Faced Wood Doors
 - 3. Section 08 33 23: Overhead Coiling Doors
 - 4. Division 26: Electrical
 - 5. Division 28: Electronic Safety and Security
- D. Products furnished but not installed under this Section to include:
 - 1. Cylinders for locks on entrance doors.

1.3 REFERENCES

- A. Standards of the following as referenced:
 - 1. American National Standards Institute (ANSI)
 - 2. Door and Hardware Institute (DHI)
 - 3. Factory Mutual (FM)
 - 4. National Fire Protection Association (NFPA)
 - 5. Underwriters' Laboratories, Inc. (UL)
 - a. UL 10C - Fire Tests Door Assemblies
 - 6. Warnock Hersey
- B. Regulatory standards of the following as referenced:
 - 1. Department of Justice, Office of the Attorney General, Americans with Disabilities Act, Public Law 101-336 (ADA).

2. CABO/ANSI A117.1: Providing Accessibility and Usability for Physically Handicapped People, 2010 edition.

1.4 SYSTEM DESCRIPTION

- A. Refer to applicable "HW SETS" for system description for electric and electro-pneumatic hardware products.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. 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. For items other than those scheduled in the "Headings" of Section 3, provide catalog information for the specified items and for those submitted.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into vertical format "hardware sets" indicating complete designations of every item required for each door or opening. Use specification HW SET numbers with any variations suffixed a, b, etc. Include the following information:
 - a. Type, style, function, size, and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - h. Keying information.
 - i. Cross-reference numbers used within schedule deviating from those specified.
 - 1) Column 1: State specified item and manufacturer.
 - 2) Column 2: State prior approved substituted item and its manufacturer.
 2. Furnish complete wiring diagrams, riser diagrams, elevation drawings, and operational descriptions of electrical components and systems, listed by opening in the hardware submittals. Elevation drawings to identify locations of the system components with respect to their placement in the door opening. Operational descriptions to fully detail how each electrical component will function within the opening, including all conditions of ingress and egress. Provide a copy with each hardware schedule submitted for approval. Supply a copy with delivery of hardware to the jobsite and another copy to the Owner at the time of project completion.
 3. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
 4. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- D. Provide samples, if requested, of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule. Submit samples prior to submission of final hardware schedule.
 1. Samples will be returned to the supplier. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated in the Work, within limitations of keying coordination requirements.
- E. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

- F. Contract closeout submittals:
 - 1. Operation and maintenance data: Complete information for installed door hardware.
 - 2. Warranty: Completed and executed warranty forms.

1.6 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware distributor, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced Architectural Hardware Consultant (AHC) who is available for consultation to Owner, Architect, and Contractor, at reasonable times during the course of the Work.
- C. Coordination Meetings:
 - 1. Organize and attend the following:
 - a. Lock distributor to meet with the Owner to finalize lock functions and keying requirements and to obtain final instructions in writing.
 - b. Lock distributor and lock, closer and exit device manufacturers' representative(s) to meet with the installer prior to commencing installation of door hardware. Instruct installer on proper installation of scheduled products.
 - 2. Organize and attend the following:
 - a. Meet with the Owner, hardware supplier, frame and door supplier, electrical sub-contractor and security sub-contractor to coordinate all electrical hardware items. Hardware supplier to provide riser diagrams, elevation drawings, wiring diagrams, and operational descriptions as required by the General and sub-contractors.
- D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges, and seals whether listed in the Hardware Schedule or not. All hardware to comply with State and local codes and UL 10C.
- E. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".
- F. All hardware is to comply with Federal and State Handicap laws. Provide tactile warning at the back of all outside levers to electrical, mechanical, machine rooms, and doors that lead to hazardous areas.

1.7 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- C. Deliver individually packaged door hardware items promptly to place of installation.
- D. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.8 WARRANTY

- A. Special warranties:
 - 1. Surface Door Closers: Thirty (30) year period
 - 2. Exit Devices: Three (3) year period
 - 3. Automatic Door Operators: Two (2) year period

4. Mortise Locks and Cylinders: Three (3) year period

1.9 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

(*DENOTES MANUFACTURER REFERENCED IN THE HARDWARE HEADINGS)

- A. Hinges:
1. Acceptable manufacturers:
 - a. Ives*
 2. Characteristics:
 - a. Templates: Provide only template-produced units.
 - b. Screws: Provide Phillips flat-head screws complying with the following requirements:
 - 1) For metal doors and frames install machine screws into drilled and tapped holes.
 - 2) For wood doors and frames install threaded-to-the-head wood screws.
 - 3) For fire-rated wood doors install #12 x 1-1/4", threaded-to-the-head steel wood screws.
 - 4) Finish screw heads to match surface of hinges or pivots.
 - c. Hinge pins: Except as otherwise indicated, provide hinge pins as follows:
 - 1) Out-Swing Exterior Doors: Non-removable pins.
 - 2) Interior Doors: Non-rising pins.
 - 3) Tips: Flat button and matching plug. Finished to match leafs.
 - d. Size: Size hinges in accordance with specified manufacturer's published recommendations.
 - e. Quantity: Furnish one pair of hinges for all doors up to 5'-0" high. Furnish one hinge for each additional 2-1/2 feet or fraction thereof.
- B. Continuous Hinges:
1. Acceptable manufacturers:
 - a. Ives*
 2. Characteristics:
 - a. Continuous gear hinges to be manufactured of extruded 6063-T6 aluminum alloy with anodized finish, or factory painted finish as scheduled.
 - b. All hinges are to be manufactured to template. Uncut hinges to be non-handed and to be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising.
 - c. Vertical door loads to be carried on chemically lubricated polyacetal thrust bearings. The door and frame leaves to be continually geared together for the entire hinge length and secured with a full cover channel. Hinge to operate to a full 180o.
 - d. Hinges to be milled, anodized, and assembled in matching pairs. Fasteners supplied to be steel self-drilling, self-tapping 12-24 x 3/4".
 - e. Provide UL listed continuous hinges at fire doors. Continuous hinges at fire doors to meet the required ratings without the use of auxiliary fused pins or studs.
- C. Cylinders:
1. Acceptable manufacturers:
 - a. Match Existing*
 2. Characteristics:
 - a. Key into the existing facility key system. Coordinate all keying with owners representative. Cylinders indicated in hardware sets indicate cylinder locations, and cylinder to be used if owner elects to establish a new key system. Locksets may need to be modified to accept existing key system cylinders.
 - b. Include keyed temporary construction keying for all cylinders.
 - c. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.

- d. Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
 - 1) Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE".
 - e. Key Material: Provide keys of nickel silver only.
 - f. Key Quantity: Furnish 3 change keys for each lock, 5 master keys for each master system, 5 grandmaster keys for each grandmaster system, 5 construction master keys, and 3 construction block out keys..
 - 1) Furnish one extra blank for each lock.
 - 2) Furnish construction master keys to General Contractor.
 - 3) Deliver keys to Owner.
- D. Locksets, Latchsets, Deadbolts:
- 1. Acceptable manufacturers:
 - a. Schalge*
 - b. Glynn Johnson*
 - 2. Mortise Locksets and Latchsets: as scheduled.
 - a. Chassis: Cold-rolled steel, handing field-changeable without disassembly.
 - b. Latchbolts: 3/4" throw stainless steel anti-friction type.
 - c. Lever Trim: Through-bolted, accessible design, cast or solid rod lever as scheduled. Spindles: Independent break-away.
 - d. Thumbturns: Accessible design not requiring pinching or twisting motions to operate.
 - e. Deadbolts: Stainless steel 1" throw.
 - f. Electric operation: Manufacturer-installed continuous duty solenoid.
 - g. Strikes: 16 gage curved stainless steel, bronze, or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
 - h. Scheduled Lock Series and Design: Schlage L series.
 - i. Certifications:
 - 1) ANSI A156.13, 1994, Grade 1 Operational, Grade 1 Security.
 - 2) ANSI/ASTM F476-84 Grade 30 UL Listed.
 - 3. Extra Heavy Duty Cylindrical Locks and Latches: as scheduled, fastened with through-bolts.
 - a. Chassis: Cylindrical design, corrosion-resistant plated cold-rolled steel.
 - b. Latch Retractors: Forged steel. Balance of inner parts: Corrosion-resistant plated steel, or stainless steel.
 - c. Lever Trim: Accessible design, independent operation, spring-cage supported, minimum 2" clearance from lever mid-point to door face.
 - d. Rosettes: Minimum 3-7/16" diameter for coverage of ANSI/DHI A115.18, 1994 door preparation, through-bolt lugs on both spring cages to fully engage this pattern.
 - e. Electric operation: Manufacturer-installed continuous duty solenoid.
 - f. Strikes: 16 gage curved steel, bronze, or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
 - g. Lock Series and Design: Falcon T series.
 - h. Certifications:
 - 1) ANSI A156.2, 1994, Series 4000, Grade 1. Tested to exceed 3,000,000 cycles.
 - 2) UL listed for A label single doors up to 4 ft x 8 ft.
 - 4. Deadbolts: as scheduled. Rotating cylinder trim rings of attack-resistant design. Mounting plates and actuator shields of plated cold-rolled steel. Mounting screws of 1/4" dia. steel and protected by drill-resistant ball bearings. Steel alloy deadbolt with hardened steel roller. Strike with 1/8" thick strike reinforcer and two 3" long screws. ANSI A156.5, 1992 Grade 1 certified.
- E. Exit Devices:
- 1. Acceptable manufacturers:
 - a. Von Duprin*
 - 2. Characteristics:
 - a. Exit devices to be "UL" listed for life safety. All exit devices for fire rated openings to have "UL" labels for "Fire Exit Hardware".
 - b. All exit devices mounted on labeled wood doors to be mounted on the door in accordance with the door manufacturer's requirements using sex nuts and bolts.
 - c. All trim to be thru-bolted to the lock stile case. Lever design to match locksets.
 - d. All exit devices to be made of brass, bronze, stainless steel, or aluminum material, powder coated, anodized, or plated to the standard architectural finishes to match the balance of
-

- the door hardware.
 - e. Provide glass bead conversion kits to shim exit devices on doors with raised glass beads.
 - f. All exit devices to be one manufacturer. No deviation will be considered.
 - g. All series exit devices to incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation.
 - h. All exit devices to be non-handed. Touchpad to extend a minimum of 1/2 of the door width and extend to the height of the cross rail housing for a "no pinch" operation. Plastic touchpads are not acceptable.
 - i. All latchbolts to be the deadlocking type. Latchbolts to have a self-lubricating coating to reduce wear. Plated or plastic coated latchbolts are not acceptable. Plastic linkage and "dogging" components are not acceptable.
 - j. Lever trim to be solid case material with a break-away feature to limit damage to the unit from vandalism. The break-away feature to utilize a clutch mechanism allowing the lever to drop to the six o'clock position and reset manually.
 - k. Surface vertical rod devices to be UL labeled for fire door applications without the use of bottom rod assemblies. Where bottom rods are required for security applications, the devices to be UL labeled for fire doors applications with rod and latch guards by the device manufacturer.
 - l. Exit devices to include impact resistant, flush mounted end cap design to avoid damage due to carts and other heavy objects passing through an opening. End cap to be of heavy-duty metal alloy construction and provide horizontal adjustment to provide alignment with device cover plate. When exit device end cap is installed, no raised edges will protrude.
- F. Closers and Door Control Devices:
- 1. Acceptable manufacturers:
 - a. LCN*
 - 2. Characteristics:
 - a. Door closers to have fully hydraulic, full rack and pinion action with a high strength cast cylinder.
 - b. All closers to utilize a stable fluid withstanding temperature range of 120oF to -30oF without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors to be provided with temperature stabilizing fluid that complies with standards UBC 7-2 (1997) and UL 10C.
 - c. Spring power to be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Hydraulic regulation to be by tamper-proof, non-critical valves. Closers to have separate adjustment for latch speed, general speed and back check.
 - d. All closers (overhead, surface, and concealed) to be of one manufacturer and carry manufacturer's ten (10) year warranty. Electric closers to have two year warranty.
 - e. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped provide adjustable units complying with ADA and ANSI A-117.1 provisions for door opening force.
 - f. Closers to be installed to allow door swing to the maximum degree of opening before striking an obstruction. Doors swinging into exit corridors to provide for corridor clear width as required by code. Where possible, mount closers inside rooms.
 - g. Combination Door Closers and Holders: Provide units designed to hold door in open position under normal usage and to release and automatically close door under fire conditions. Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire detectors, provided with normally closed switching contacts.
 - h. Magnetic Door Holders to be heavy duty wall mounted with metal housing and complete mounting hardware. Provide 24V holding coils unless otherwise scheduled.
- G. Automatic Operators:
- 1. Acceptable manufacturers:
 - a. LCN*
 - b. Stanley
 - c. Besam
 - 2. Characteristics:
 - a. ADA operators with a closing force of 8 lbs. to include a manual "Off/Auto/Hold-Open" switch and to incorporate a failsafe feature. In the "Off" mode, and in the event of a power failure, the door to operate manually without damage to operator components.

- b. Operators to provide adjustments by microprocessor for opening speed, backcheck speed, hold open (from 5 to 30 seconds), closing speed, opening force, soft-start and safety stop, and reverse in opening and closing cycle.
 - c. Operators to be UL and NEC compliant, include soft-start motor control and meet the following standards:
 - 1) ADA Law Section 4.13.12
 - 2) ANSI A156.19, Section 2.1
 - 3) ANSI A117.1, Section 4.13.13
 - 4) UL 325
 - 5) UL Listed for Fire Rated Door Operators with Automatic Closers, File (GUJY)
 - d. Operators to be furnished with all relays, time delay modules, controls, actuators, wiring diagrams, etc. as required to ensure complete and properly functioning installation.
 - e. Installation of automatic operators to be performed by factory-trained installer skilled in the installation of automatic door operators and equipment. All low voltage switch hookups are the responsibility of the operator installer, including temporary wiring hookup to plug into wall outlet for test of system. Final hookup of 115VAC power to be performed by and coordinated with the General Contractor's electrical contractor.
 - f. The General Contractor to furnish a certificate, executed by a representative of the automatic operator manufacturer, certifying that all operators have been installed in accordance with the manufacturer's instructions, have been inspected and adjusted, and are operating as designed.
- H. Overhead Door Stops and Holders:
- 1. Acceptable manufacturers:
 - a. Glynn Johnson*
 - 2. Characteristics:
 - a. Provide door stops and holders of brass, bronze or stainless steel.
 - b. Concealed stops and holders to be installed with the jamb bracket mortised flush with the bottom of the jamb. The arm and channel to be mortised into the door.
 - c. Surface-mounted stops and holders to be installed with the jamb bracket mounted on the stop.
- I. Floor Stops and Wall Bumpers:
- 1. Acceptable manufacturers:
 - a. Ives*
 - 2. Characteristics: Refer to Part 3, Hardware Schedule.
- J. Door Bolts/Coordinators:
- 1. Acceptable manufacturers:
 - a. Ives*
 - 2. Characteristics:
 - a. Flush bolts to be forged brass 6-3/4" x 1", with 1/2" diameter bolts. Plunger to be supplied with milled surface one side that fits into a matching guide.
 - b. Automatic flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
 - c. Self-latching flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
 - d. Automatic flush bolts and self-latching flush bolts are to be UL listed for fire door application without bottom bolts.
 - e. Furnish dust proof bottom strikes.
 - f. Coordinator to be soffit mounted non-handed fully automatic UL listed coordinating device for sequential closing of paired doors with or without astragals.
 - g. Provide filler pieced to close the header. Provide brackets as required for mounting of soffit applied hardware.
- K. Push Plates:
- 1. Acceptable manufacturers:
 - a. Ives*
 - 2. Characteristics:
 - a. Exposed Fasteners: Provide manufacturers standard exposed fasteners.
 - b. Material to be stainless steel.
 - c. Provide plates sized as shown in Part 3, Hardware Schedule.
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- L. Door Pulls & Pull Plates:
 - 1. Acceptable manufacturers:
 - a. Ives*
 - 2. Characteristics:
 - a. Provide concealed thru-bolted trim on back to back mounted pulls, but not for single units.
 - b. Material to be stainless steel.
 - c. Provide units of types and sizes shown in Part 3, Hardware Schedule.
- M. Protective Plates:
 - 1. Acceptable manufacturers:
 - a. Ives*
 - 2. Characteristics:
 - a. Provide manufacturers standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
 - b. Materials:
 - 1) Metal Plates: Stainless Steel, .050 inch (U.S. 18 gage).
 - c. Fabricate protection plates not more than 2" less than door width on push side and not more than 1" less than door width on pull side.
- N. Thresholds:
 - 1. Acceptable manufacturers:
 - a. Zero Weatherstripping*
 - 2. Types: Indicated in Part 3, Hardware Schedule.
- O. Door Seals/Gasketing:
 - 1. Acceptable manufacturers:
 - a. Zero Weatherstripping*
 - 2. Types: Indicated in Part 3, Hardware Schedule.
- P. Silencers:
 - 1. Acceptable manufacturers:
 - 2. Ives*
 - 3. Three (3) for each single door; two (2) for each pair of doors.
 - 4. Omit silencers at openings scheduled to receive perimeter gasketing.
- Q. Security Equipment:
 - 1. Characteristics:
 - a. Provide items as found in Part 3, Hardware Schedule.
 - 2. Coordinate security equipment with electrical systems.

3.2 MATERIALS AND FABRICATION

- A. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- B. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 - 1. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
 - 2. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
 - 3. Unless indicated otherwise provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners.

4. Use thru-bolts for installation of all exit devices, closers, and overhead stops. Coordinate with wood doors and metal doors and frames. Where thru-bolts are used, provide sleeves for each thru-bolt as a means of reinforcing the work, or use sex nut and bolt fasteners.

3.3 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- B. Provide finishes that match those established by ANSI or, if none established, match the Architect's sample.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

PART 3 EXECUTION

4.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
- B. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- D. Set units level, plumb, and true to line and location. Adjust and reinforce the 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 in accordance with industry standards.
- F. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers".
- G. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

4.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to function properly with final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Door Hardware Supplier's Field Service:
 1. Inspect door hardware items for correct installation and adjustment after complete installation of door hardware.

2. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
3. File written report of this inspection to Architect.

4.3 HARDWARE SCHEDULE

HARDWARE GROUP NO. 003A

1-402A	1-411A	1-414A	1-415A	1-436A	1-463A
1-464A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	ENTRY / OFFICE LOCK	T521L6 DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	WALL STOP	WS406CCV		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 004A

1-455A	1-455B	1-468B			

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	CLASSROOM LOCK	T561L6 QUA		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 004F

1-410A	1-412A				

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	CLASSROOM LOCK	T561 LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	WALL STOP	WS406CCV		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 004G

1-432A	1-433A				

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X		652	IVE

			4.5			
2	EA	CONST LATCHING BOLT	FB61T		630	IVE
1	EA	CLASSROOM LOCK	T561 LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
2	EA	SURFACE CLOSER	4050 EDA		689	LCN
2	EA	FIRE/LIFE WALL MAG	SEM7850		689	LCN
1	EA	GASKETING	188SBR PSA		BR	ZER
1	EA	MEETING STILE	8194AA		AA	ZER

HARDWARE GROUP NO. 005A

1-452A	1-454A				

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PRIVACY LOCK	T301S DAN		626	FAL
1	EA	OH STOP	90S		652	GLY
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 005B

1-456A	1-457A				

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PRIVACY LOCK	T301S DAN		626	FAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 005E

1-451A	1-453A				

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		630	IVE
1	EA	PUSH PLATE	8200 6" X 16"		630	IVE
1	EA	PULL PLATE	8303 8" 4" X 16"		630	IVE
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE

3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 005G

1-461A	1-462A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		630	IVE
1	EA	PUSH PLATE	8200 6" X 16"		630	IVE
1	EA	PULL PLATE	8303 8" 4" X 16"		630	IVE
1	EA	OH STOP	90S		652	GLY
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 006A

1-437A	1-468E					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	T581LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER
3	EA	SILENCER	SR64 AT NON-RATED		GRY	IVE

HARDWARE GROUP NO. 007A

1-465A	1-467A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	T581LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER
1	EA	DOOR BOTTOM	369AA		AA	ZER

HARDWARE GROUP NO. 007C

1-460A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	T581LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	WALL STOP	WS406CCV		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 007D

1-431B					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	T581LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 008A

1-435A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	T101 DAN		626	FAL
1	EA	WALL STOP	WS406CCV		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 008B

1-450A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	T101 DAN		626	FAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 008D

1-471A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	PASSAGE SET	T101 DAN		626	FAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 008G

1-434A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	T101 DAN		626	FAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7850		689	LCN
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 009A

1-466A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	T581LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE	~	630	VON
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER
3	EA	SILENCER	SR64 @ NON-RTD		GRY	IVE
1	EA	MULTITECH READER	MT15	~	BLK	SCE
1	EA	DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER	BY SECURITY			

	SUPPLY	CONTRACTOR		

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL UNLOCKS ELECTRIC STRIKE. ELECTRIC STRIKE RE-LOCKS AFTER PRESET INTERVAL. FREE EGRESS AT ALL TIMES. COORDINATE WITH ELECTRICAL, SECURITY AND FIRE LIFE SAFETY SYSTEMS

HARDWARE GROUP NO. 009B

1-472B				

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	T581LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE	~	630	VON
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER
3	EA	SILENCER	SR64 @ NON-RTD		GRY	IVE
1	EA	MULTITECH READER	MT15	~	BLK	SCE
1	EA	DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL UNLOCKS ELECTRIC STRIKE. ELECTRIC STRIKE RE-LOCKS AFTER PRESET INTERVAL. FREE EGRESS AT ALL TIMES. COORDINATE WITH ELECTRICAL, SECURITY AND FIRE LIFE SAFETY SYSTEMS

HARDWARE GROUP NO. 009F

1-458B				

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	T581LD-YAL DAN		626	FAL
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE	~	630	VON
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER
3	EA	SILENCER	SR64 @ NON-RTD		GRY	IVE

1	EA	MULTITECH READER	MT15	~	BLK	SCE
1	EA	DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL UNLOCKS ELECTRIC STRIKE. ELECTRIC STRIKE RE-LOCKS AFTER PRESET INTERVAL. FREE EGRESS AT ALL TIMES. COORDINATE WITH ELECTRICAL, SECURITY AND FIRE LIFE SAFETY SYSTEMS

HARDWARE GROUP NO. 010E

1-470B						

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-06-SNB		626	VON
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 010F

1-468C	1-468D					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	PANIC HARDWARE	98-L-06-SNB		626	VON
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	SURFACE CLOSER	4050 RW/PA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406CCV		630	IVE
1	EA	GASKETING	188SBR PSA		BR	ZER

HARDWARE GROUP NO. 102A

1-458A	1-470A					

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X		630	IVE

			4.5 NRP			
1	EA	POWER TRANSFER	EPT10	~	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-HW-9875-NL-L/TRIM 24 VDC	~	626	VON
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	90 DEG OFFSET PULL	8190HD 10" O		630	IVE
1	EA	SURFACE CLOSER	4050 SCUSH		689	LCN
1	EA	CUSH SHOE SUPPORT	4050-30		689	LCN
1	EA	RAIN DRIP	142AA		AA	ZER
1	SET	GASKETING	PS-074			STE
1	EA	DOOR SWEEP	FAS-SEAL			STE
1	EA	THRESHOLD	566A-226		A	ZER
1	EA	MULTITECH READER	MT15	~	BLK	SCE
1	EA	DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL RETRACTS LATCH BOLT. LATCH BOLT RE-LATCHES AFTER PRESET INTERVAL. RX SWITCH IN PANIC BAR SHUNTS DPS. FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. 102E

1-472A	1-473A				

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP		630	IVE
1	EA	POWER TRANSFER	EPT10	~	689	VON
1	EA	EU MORTISE LOCK	L9492LEU 06A 09-544 DM CON 12/24 VDC	~	630	SCH
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	SURFACE CLOSER	4050 SCUSH		689	LCN
1	EA	CUSH SHOE SUPPORT	4050-30		689	LCN
1	EA	RAIN DRIP	142AA		AA	ZER
1	SET	GASKETING	PS-074			STE
1	EA	DOOR SWEEP	FAS-SEAL			STE
1	EA	THRESHOLD	566A-226		A	ZER
1	EA	MULTITECH	MT15	~	BLK	SCE

1	EA	READER DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL UNLOCKS ELECTRIFIED LOCKSET. AFTER PRESET TIME INTERVAL, DOORS CLOSE AND LOCKSETS RELOCK. FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. 104A

1-400A						

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	224HD EPT		628	IVE
2	EA	POWER TRANSFER	EPT10	~	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL- HW-9827-EO 24 VDC	~	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL- HW-9827-L-06 24 VDC	~	626	VON
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
1	EA	SURF. AUTO OPERATOR	9553 REG2 MS~		ANCLR	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-856		630	LCN
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS		630	IVE
1	SET	GASKETING	PS-074			STE
1	EA	MEETING STILE	8194AA		AA	ZER
1	EA	DOOR SWEEP	FAS-SEAL			STE
1	EA	THRESHOLD	566A-226		A	ZER
1	EA	MULTITECH READER	MT15	~	BLK	SCE
2	EA	DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS	~	LGR	SCE

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL OR PRESSING ACTUATOR ENGAGES RELEASES EXIT DEVICES AND AUTOMATIC OPERATOR. DOORS CLOSE AND EXITS RE-LOCKS AFTER PRESET INTERVAL

HARDWARE GROUP NO. 104B

1-468A						

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR

2	EA	CONT. HINGE	224HD EPT		628	IVE
2	EA	POWER TRANSFER	EPT10	~	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-HW-9827-EO 24 VDC	~	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-HW-9827-L-NL-06 24 VDC	~	626	VON
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
2	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	RAIN DRIP	142AA		AA	ZER
1	SET	GASKETING	PS-074			STE
1	EA	MEETING STILE	8194AA		AA	ZER
1	EA	DOOR SWEEP	FAS-SEAL			STE
1	EA	THRESHOLD	566A-226		A	ZER
1	EA	MULTITECH READER	MT15	~	BLK	SCE
2	EA	DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS	~	LGR	SCE

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL RELEASES EXIT DEVICES AND DOORS CAN BE OPENED. DOORS CLOSE AND EXITS RE-LOCKS AFTER PRESET INTERVAL

HARDWARE GROUP NO. 104C

1-430A					

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
7	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	~	652	IVE
1	SET	CONST LATCHING BOLT	FB61P		630	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	STOREROOM W/DEADBOLT	L9480L 06A 09-544		630	SCH
1	EA	CYLINDER	AS REQ - T KEWAY		626	YAL
2	EA	SURFACE CLOSER	4050A SCUSH		689	LCN
1	SET	GASKETING	PS-074			STE
1	EA	MEETING	8194AA		AA	ZER

		STILE				
1	EA	DOOR SWEEP	FAS-SEAL			STE
1	EA	THRESHOLD	566A-226		A	ZER
1	EA	MULTITECH READER	MT15	~	BLK	SCE
2	EA	DOOR CONTACT	679-05HM		BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION PRESENTATION OF VALID CREDENTIAL UNLOCKS ELECTRIFIED LOCKSET. AFTER PRESET INTERVAL, DOORS CLOSE AND LOCKSET RELOCKS. FREE EGRESS AT ALL TIMES. COORDINATE WITH ELECTRICAL, SECURITY AND FIRE LIFE SAFETY SYSTEMS

HARDWARE GROUP NO. 999.1

1-400B	1-431A				

PROVIDE EACH RU DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ALL HARDWARE	BY ROLL UP DOOR MFG	~		

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

END OF SECTION

DOOR INDEX

Door Numbers	HwSet#
1-400A	104A
1-400B	999.1
1-402A	003A
1-410A	004F
1-411A	003A
1-412A	004F
1-414A	003A
1-415A	003A
1-430A	104C
1-431A	999.1
1-431B	007D
1-432A	004G
1-433A	004G
1-434A	008G
1-435A	008A
1-436A	003A
1-437A	006A
1-450A	008B
1-451A	005E
1-452A	005A
1-453A	005E
1-454A	005A
1-455A	004A
1-455B	004A
1-456A	005B
1-457A	005B
1-458A	102A
1-458B	009F
1-460A	007C
1-461A	005G
1-462A	005G
1-463A	003A
1-464A	003A
1-465A	007A
1-466A	009A
1-467A	007A
1-468A	104B
1-468B	004A
1-468C	010F
1-468D	010F
1-468E	006A
1-470A	102A
1-470B	010E
1-471A	008D
1-472A	102E

Door Numbers	HwSet#
1-472B	009B
1-473A	102E

**SECTION 08 8000
GLAZING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Laminated glass interlayers.

1.2 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
- C. Section 08 1423 - Laminate-Faced Flush Wood Doors: Glazed lites in doors.
- D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
- E. Section 08 8300 - Mirrors.
- F. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.3 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015 (Reaffirmed 2020).
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2019).
- D. ASTM C1036 - Standard Specification for Flat Glass 2021.
- E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
- F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass 2019.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.
- H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass 2021a.
- I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings 2016.
- J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2010.
- K. GANA (GM) - GANA Glazing Manual 2008.
- L. GANA (SM) - GANA Sealant Manual 2008.
- M. GANA (LGRM) - Laminated Glazing Reference Manual 2009.
- N. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).
- O. NFRC 100 - Procedure for Determining Fenestration Product U-factors 2017.

- P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence 2014, with Errata (2017).
- Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems 2017.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures for submittal procedures.
- B. Product Data on Insulating Glass Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 12 by [] inch in size of glass units.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.
- G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- H. Impact Resistance Data: Manufacturer's current product approval notice indicating product acceptance, as tested for large and small missile impact per SBCCI SSTD 12 and ASTM E1996.
- I. Florida Requirements: Glazing assemblies have been tested to Florida Building Code Testing Application Standards [TAS] 201-Impact Test Procedures; [TAS] 202-Criteria For Testing Impact and Nonimpact Resistant Building Envelope Components Using Uniform Static Air Pressure (Wind Zone 4, 80 fps); and [TAS] 203-Criteria for Testing Products Subject to Cyclic Wind Pressure Loading; for high-velocity hurricane zone, indicating ability to withstand missile impact, structural load, and cyclic wind pressure tests prescribed by the Florida Building Code (FBC).

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
 - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
 - a. Insulating Glass Certification Council (IGCC).
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.
- D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.7 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.

- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.
- C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Design Pressure: Calculated in accordance with applicable codes. See Structural drawings for additional information.
 - 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 - 3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 4. Glass thicknesses listed are minimum.
- B. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
 - 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.2 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
 - 1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
 - 2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
 - 3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
 - 4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
 - 5. Impact Resistant Safety Glass: Complies with ANSI Z97.1 - Class B, or 16 CFR 1201 - Category I criteria.
 - 6. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.
 - 7. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.
- B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
 - 1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.
 - 2. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.
 - 3. Ionoplast Interlayer: 0.035 inch thick, minimum.

2.3 INSULATING GLASS UNITS

- A. Manufacturers:
 - 1. AGC Glass North America, Inc: www.agcglass.com/#sle.

2. Guardian Glass, LLC: www.guardianglass.com/#sle.
 3. Viracon, Apogee Enterprises, Inc: www.viracon.com/#sle.
 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.
- C. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
 3. Metal Edge Spacers: Aluminum, bent and soldered corners.
 4. Nonmetal Edge Spacers: Polypropylene warm-edge technology design.
 - a. Spacer Width: As required for specified insulating glass unit.
 - b. Spacer Height: Manufacturer's standard.
 - c. Manufacturers:
 - 1) Quanex IG Systems, Inc; Super Spacer TriSeal: www.quanex.com/#sle.
 - 2) Technoform Glass Insulation; TGI-Spacer: www.glassinsulation.us/#sle.
 5. Spacer Color: Black.
 6. Edge Seal:
 - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
 - b. Single-Sealed System: Provide silicone, polysulfide, or polyurethane sealant as seal applied around perimeter.
 - c. Color: Black.
 7. Purge interpane space with dry air, hermetically sealed.
- D. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
 2. Space between lites filled with air.
 3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Green, match
 - b. Coating: Low-E (passive type), on #2 surface.
 4. Metal edge spacer.
 5. Inboard Lite: Fully tempered and laminate float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 6. Total Thickness: 1 5/16 inch.
 7. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.50, nominal.
 8. Solar Heat Gain Coefficient (SHGC): See sheet G010.
 9. Glazing Method: Dry glazing method, gasket glazing.
- E. Type IG-2 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior Storefront Doors.
 2. Space between lites filled with air.
 3. Outboard Lite: Fully tempered float glass, 3/16 inch thick, minimum.
 - a. Tint: Green.
 - b. Coating: Low-E (passive type), on #2 surface.
 4. Metal edge spacer.
 5. Inboard Lite: Fully tempered and laminated float glass, 3/16 inch thick, minimum.
 - a. Tint: Clear.
 6. Total Thickness: 1 inch.
 7. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.83, nominal.
 8. Solar Heat Gain Coefficient (SHGC): See sheet G010.
 9. Glazing Method: Dry glazing method, gasket glazing.

2.4 GLAZING UNITS

- A. Type G-2 - Monolithic Interior Vision Glazing:
1. Applications: Interior glazing unless otherwise indicated.
 2. Glass Type: Fully tempered float glass.
-

- 3. Tint: Clear.
- 4. Thickness: 1/4 inch, nominal.

2.5 LAMINATED GLASS INTERLAYERS

- A. Type LGL-1 - Polyvinyl Butyral (PVB) Interlayer for Laminated Glazing:
 - 1. Functionality: Post-breakage safety and hurricane resistance.
 - 2. Applications:
 - a. Interior laminated pane of insulating glass unit, Type IG-1 and IG-2.
 - 3. Color: Clear.
 - 4. Thickness: As required for indicated performance of laminated glass application.
 - 5. Manufacturers, subject to compliance with Florida Product Approvals:
 - a. Kuraray America, Inc; Trosifol Safety: www.kuraray.us.com/#sle..
 - b. Kuraray America, Inc; Sentryglas: www.kuraray.us.com/#sle..
 - c. Eastman Chemical Company; Saflex: www.saflex.com/#sle..

2.6 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

2.7 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.

PART 3 EXECUTION

3.1 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.3 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.4 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.5 INSTALLATION - PRESSURE GLAZED SYSTEMS

- A. Application - Exterior Glazed: Set glazing infills from exterior side of building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install pressure plates without displacing glazing gasket; exert pressure for full continuous contact.
- E. Install cover plate.

3.6 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- C. Monitor and report installation procedures and unacceptable conditions.

3.7 CLEANING

- A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- C. Remove nonpermanent labels immediately after glazing installation is complete.

- D. Clean glass and adjacent surfaces after sealants are fully cured.
- E. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.8 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

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END OF SECTION

**SECTION 08 8300
MIRRORS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass mirrors.
 - 1. Annealed float glass.

1.2 RELATED REQUIREMENTS

- A. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Metal mirror frames.

1.3 REFERENCE STANDARDS

1.4 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data on Mirror Types: Submit structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds: Submit chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Manufacturer's Certificate: Certify that mirrors, meets or exceeds specified requirements.
- E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods.
- B. Fabricate, store, transport, receive, install, and clean mirrors in accordance with manufacturer's recommendations.

1.6 FIELD CONDITIONS

- A. Do not install mirrors when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.7 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.

- B. Mirror Glass: Clear, annealed float glass; ASTM C1036, with copper and silver coatings, and protective overcoating.
 - 1. Thickness: 1/4 inch.
 - 2. Edges: Arrised.
 - 3. Size: As indicated on drawings.

2.2 ACCESSORIES

- A. Mirror Attachment Accessories: Stainless steel clips.
- B. Mirror Adhesive: Silicone pre-polymer based, chemically compatible with mirror coating and wall substrate.
 - 1. Application Temperature: Minus 35 to 140 degrees F at contact surfaces.
 - 2. Volatile Organic Content (VOC): Less than 7 percent by weight.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that openings for mirrored glazing are correctly sized and within tolerance.
- B. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous mirror frames or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive sealant.
- C. Prepare installation in accordance with ASTM C1193 for solvent release sealants, and install sealant in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. Install mirrors in accordance with manufacturer's recommendations.
- B. Set mirrors plumb and level, and free of optical distortion.
- C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.
- D. Frameless Mirrors: Set mirrors in proper place with adhesive, applied in accordance with adhesive manufacturer's instructions.
- E. Frameless Mirrors: Set mirrors with clips, and anchor rigidly to wall construction.

3.4 CLEANING

- A. Remove wet glazing materials from finish surfaces.
- B. Remove labels after work is complete.
- C. Clean mirrors and adjacent surfaces.

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END OF SECTION

**SECTION 09 2216
NON-STRUCTURAL METAL FRAMING**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.
 - 3. Concealed anchorage and support components for ceiling- and wall-mounted equipment, specialties, cabinets, and other items.
- B. Related Requirements:
 - 1. Section 07 2116: Thermal batt insulation installed within studs.
 - 2. Section 07 8443 "Fire-Resistive Joint Systems" for head-of-wall joint systems installed with non-load-bearing steel framing.
 - 3. Section 09 2900 "Gypsum Board".

1.2 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Coordination: Submit related product data/shop drawings for products specified in other Specification sections simultaneously for approval.
 - 1. Gypsum board product data for gypsum board to be used as part of non-structural metal framing.
 - 2. Gypsum board shaft wall product data for shaft walls related to non-structural metal framing.
- C. Product Data: Submit manufacturer's product data, typical installation details and other data for each type of product listed to show compliance with the requirements [<>].

1.3 INFORMATION SUBMITTALS

- A. Span and Deflection Design Criteria: Provide height to load deflection charts showing studs supplied conform to deflection limit scheduled and allowed per ASTM C 754.
 - 1. Mark on charts showing all major partitions scheduled conformance with criteria.
 - 2. Submit manufacturer's certification of stud size, thickness, and spacing complying with performance requirements and selections made by architect are correct for application shown.
- B. Evaluation Reports: ICC-ES reports.
 - 1. Steel stud framing.
 - 2. Manufactured gypsum ceiling support grid system.
 - 3. Firestop tracks.

1.4 QUALITY ASSURANCE

- A. Installer's Qualifications: Firm and individuals with a minimum 5 consecutive years' experience in the installation of specified products on projects similar in material, design, complexity and extent to this Project, and whose work has resulted in applications with a record of successful in-service performance.
- B. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer acceptable to the gypsum board manufacturer.

1.5 HANDLING

- A. Delivery: Protect materials from excessive moisture in shipment, storage, and handling.
- B. Storage: Store off ground, either in a dry, ventilated, enclosed space or protected with suitable waterproof coverings.

- C. Handling: Protect non-structural framing members from rusting and damage.

1.6 SEQUENCING

- A. Coordinate placement of concealed internal wall reinforcement, such as backing plates, for items to be attached to metal support systems.
- B. Coordinate installation of ceiling and soffit suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorage to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.
- C. Furnish concrete inserts, and other devices indicated, to other trades for installation well in advance of time needed for coordination with other construction.

PART 2 -PRODUCTS

2.1 DESCRIPTIONS -GENERAL

- A. Manufacturers: Subject to compliance with requirements, provide products by manufacturers listed in Document 00 2150 - Owner's Preferred Vendor List. No substitutions permitted.
- B. Performance Requirements: Provide metal framing assemblies to withstand the loads prescribed within the specified deflection limits.
 - 1. Partition Deflection Limit per ASTM C 754: Allowing for 5 lbf/sq ft lateral load.
 - a. Typical Finishes: L/240.
 - b. Tile, Plaster, Stone or Similar Finishes: L/360.
 - 2. Where partition heights exceed stud manufacturer's recommended spans, and to resist deflection limits [$\leq$], provide one of the following:
 - a. Heavier stud gage, except at walls with STC ratings.
 - b. Closer stud spacing.
 - c. Deeper stud size (space permitting, as determined by Architect).
 - d. Above-ceiling bracing, anchored to structure above.
 - 3. Interior Ceilings:
 - a. Limited to deflection of suspended metal stud ceiling system or grid system with gypsum board of L/240.
- C. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
 - 1. Conform to applicable code for fire rated assemblies. Construct assemblies to achieve fire resistance ratings indicated on Drawings in accordance with UL, GA, or other acceptable tested approved assemblies. Where no test number is referenced, utilize and submit a tested approved assembly that achieves the fire rating required by the Drawings, including the Life Safety Plan.
 - 2. Assemblies listed do not necessarily indicate all assemblies that may be used in this project. Contractor may propose alternate UL listed assemblies or approved tested assemblies that meet the same requirements to the Architect for consideration. Contractor may not substitute assemblies without written authorization by the Architect.
 - 3. Drawings, keys or written descriptions located in the Contract Documents to describe fire rated assemblies for beams, floors, roofs, columns, walls, partitions and through-penetration firestop systems do not necessarily call out each and every specific requirement of the designated UL listed assembly identified or approved tested assemblies. It is the Contractor's responsibility to become thoroughly familiar with the corresponding requirements published in the most recent issue of the Underwriters Laboratories Inc. Fire Resistance Directory and construct the fire rated assemblies in strict accordance with those requirements.
 - 4. Prescribed UL Design Numbers or approved tested assemblies which may be called for on this Project and may be required as determined during the construction process if existing conditions dictate. The list of assemblies below is not intended to represent all rated conditions designated in whole of the Contract Documents or those that may be considered viable alternates (where approved by Architect). UL listed fire rated assemblies or approved tested assemblies include, but are not limited to the following:

- a. Wall Systems: Refer to Drawings.
 - b. Fire-Resistive Joint Systems and Through-Penetrations Firestop Systems: Refer to Section 078400 "Firestopping."
- D. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
- 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal at interior studs unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized, unless otherwise indicated.
- B. Studs and Runners: ASTM C 645.
- 1. Steel Studs and Runners:
 - a. Minimum Base Metal Thickness: 0.018 inches or as required to comply with span and deflection design criteria, before application of protective coating.
 - b. Depth: As indicated on drawings. Contractor may request consideration of other sizes on the basis of strength and stability requirements.
- C. Slip-Type Head Joints: Where indicated, provide one of the following:
- 1. Double-Runner System: ASTM C 645 top runners, inside runner with 4-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 - 2. Proprietary Deflection Track/Clips: Steel sheet top runner and clip system manufactured to prevent cracking of gypsum board applied to interior partitions resulting from deflection of structure above; in thickness indicated for studs and in width to accommodate depth of studs.
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) Dietrich Metal Framing, "Fast Stop" clips, 0.064 inches thick, used in conjunction with 0.033 inch deep leg track.
 - 2) Marino / WARE WSC-DEFLEX Series slide clips, used in conjunction with 0.033 inch thick deep leg track.
 - 3) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series.
 - 4) Stockton Products, Flexible Trak, FLT.
- D. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fire Trak Corp.; Fire Trak System attached to studs with Fire Trak Posi Klip.
 - b. The Steel Network, Inc.; VertiClip SLD Series or VertiTrack VTD Series.
 - c. Substitutions: Comparable product from another steel framing manufacturer listed, provided track system has been tested as part of an assembly according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Single Deep-Leg Track: Not permitted.
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
- 1. Minimum Base-Metal Thickness: 0.053 inch Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch- wide flanges.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068 inch- thick, galvanized steel.
- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
- 1. Minimum Base-Metal Thickness: 0.018 inch
 - 2. Depth: 7/8 inch.
- G. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges.
- 1. Depth: 3/4 inch.

2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch.
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062 inch- diameter wire, or double strand of 0.048-inch- diameter wire.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 1. Products: Subject to compliance with requirements, provide the following:
 - a. USG Corporation; SHEETROCK Acoustical Sealant.
 2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.
 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install bracing at terminations in assemblies.
- C. Installation Tolerances: Install each steel partition, soffit, and ceiling framing and furring members to comply with the following:
 1. Variation in Level, Plumb, and True to Line: Maximum 1/8 inch in 10 feet
 2. Variation in Plane of Adjacent Fastening Surfaces: Not more than 1/8 inch from the plane formed by the faces of adjacent framing.
 3. Variation in Framing and Furring Spacing: Not more than 1/8 inch.

3.4 INSTALLING STEEL PARTITION FRAMED ASSEMBLIES

- A. Install tracks (runners) at floors, ceilings, and structural walls and columns where gypsum board assemblies abut other construction.
 1. Where studs are installed directly against exterior walls or dissimilar metals, install asphalt-felt or foam-gasket isolation strip between studs and wall.
 2. Acoustical Sealant Installation at Sound Walls: Install in accordance with ASTM C 919.
 - a. Place two beads of acoustic sealant between runners and substrate studs and adjacent construction to achieve an acoustic seal.

- b. Place two beads of acoustic sealant between studs and adjacent vertical surfaces board to achieve an acoustic seal.
- 3. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.
 - a. Space studs as follows:
 - 1) Single-Layer Construction: 16 inches o/c, unless otherwise indicated or required to comply with span and deflection design criteria.
- 4. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
- 5. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - a. Use double runner system or proprietary deflection track at all locations except fire rated partitions.
 - b. Use approved firestop track at fire rated partitions.

3.5 DOOR OPENINGS

- A. Rough openings up to 50 inches wide:
 - 1. Jamb: Install two boxed studs, minimum 0.033 inch thick at each jamb or required to comply with span and deflection design criteria.
 - a. Extend jamb studs to underside of overhead structure and attach.
 - b. Screw vertical studs at jambs to jamb anchor clips on door frames.
 - 2. Header: Install runner track section minimum 0.033 inch thick or a box stud header, minimum 0.018 inch thick, (for cripple studs) at head and secure to jamb.
 - a. Install cripple studs at head adjacent to each jamb stud, with minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
- B. Rough openings over 50 inch to 74 inch wide:
 - 1. Jamb: Install two boxed studs, minimum 0.054 inch thick at each jamb or required to comply with span and deflection design criteria.
 - a. Extend jamb studs to underside of overhead structure and attach.
 - b. Screw vertical studs at jambs to jamb anchor clips on door frames.
 - 2. Header: Install a box stud header minimum 0.054 inch thick, unless otherwise indicated.
 - a. Secure box header to jamb studs.
 - b. Install runner track section (for cripple studs) at head and secure to jamb studs.
 - c. Install cripple studs at head adjacent to each jamb stud, with minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
- C. Rough openings over 74 inches wide and all lead lined and automatic doors:
 - 1. Jamb: Install two boxed studs, minimum 0.068 inch thick at each jamb or required to comply with span and deflection design criteria or C3x5 steel channel.
 - a. Extend jamb studs to underside of overhead structure and attach.
 - b. Screw vertical studs at jambs to jamb anchor clips on door frames.
 - 2. Header: Install a box stud header minimum 0.068 inch thick, unless otherwise indicated or C4x5.4 steel channel.
 - a. Secure box header to jamb studs.
 - b. Install runner track section (for cripple studs) at head and secure to jamb studs.
 - c. Install cripple studs at head adjacent to each jamb stud, with minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
- D. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- E. Partitions Scheduled to Receive:
 - 1. Tile Finish: Provide minimum 0.033-inch thick studs.
 - 2. Bumper or Guard Rails: Provide minimum 0.033-inch thick studs.
 - 3. Equipment: Where wall mounted equipment, woodwork, and casework items are indicated or elsewhere as shown on Drawings, provide minimum 0.033-inch thick studs.

- F. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure, unless noted otherwise.
1. Firestop Track: Install to maintain continuity of fire-resistance-rated assembly indicated.
- G. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

3.6 METAL BACKING PLATES:

- A. Provide metal backing plates to support loads imposed at wall-mounted and wall-hung items that require backing plates, include, without limitation, the following:
1. Toilet accessories.
 2. Metal lockers.
 3. Millwork, other than upper cabinets.
 4. Computer equipment wall mounting brackets.
 5. Wall protection.
- B. Backing plates not provided with fixtures and equipment shall be long enough to span across minimum 3 studs, unless otherwise indicated, and may be one of the following:
1. Galvanized steel plate 0.053-inch thick minimum by 4 inches wide.
 2. 3-5/8 inches n-punched wide flange steel stud of 0.053 inch thick. Notch studs so that backing plate will be flush with exterior face of stud.
 3. At Contractor's option, solid wood blocking may be used instead of metal backing plates. Refer to Section 06 1053 "Miscellaneous Carpentry."
- C. Wood blocking only will be acceptable at the following locations:
1. Television equipment.
 2. Wall-mounted door stops.
 3. Wall-mounted grab bars.
 4. Upper wall millwork / casework units.
 5. Wall-mounted handrails.

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END OF SECTION

**SECTION 09 2400
CEMENT PLASTERING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cement plastering.

1.2 RELATED REQUIREMENTS

- A. Section 04 2200 - Concrete Unit Masonry: Concrete masonry for plaster.

1.3 REFERENCE STANDARDS

- A. ASTM C91/C91M - Standard Specification for Masonry Cement 2018.
- B. ASTM C150/C150M - Standard Specification for Portland Cement 2021.
- C. ASTM C206 - Standard Specification for Finishing Hydrated Lime 2014.
- D. ASTM C897 - Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters 2015 (Reapproved 2020).
- E. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster 2021.
- F. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering 2006 (Reapproved 2019).
- G. ASTM C1328/C1328M - Standard Specification for Plastic (Stucco) Cement 2012.

1.4 SUBMITTALS

- A. See Section 01 3100 - Submittal Procedures, for submittals procedures.
- B. Product Data: Provide data on plaster materials and trim accessories.
- C. Evaluation Service Reports: Show compliance with specified requirements.
- D. Samples:
 - 1. Submit two samples, 12 by [] inch in size illustrating finish color and texture.
- E. Installer's Qualification Statement.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.6 FIELD CONDITIONS

- A. Exterior Plaster Work: Do not apply plaster when substrate or ambient air temperature is 40 degrees F or lower, or when temperature is expected to drop below 40 degrees F within 48 hours of application.

PART 2 PRODUCTS

2.1 CEMENT PLASTER APPLICATIONS

- A. Solid Plaster Base: Concrete masonry.
 - 1. Plaster Type: Jobsite mixed plaster.
 - 2. Number of Coats: Three.
 - 3. First Coat: Apply to a nominal thickness of 1/4 inch.
 - 4. Second Coat: Apply to a nominal thickness of 1/4 inch.
 - 5. Finish Coat: Apply to a nominal thickness of 1/8 inch.
 - a. Texture: Match Existing.
 - 6. Finish: Acrylic.

2.2 JOBSITE MIXED CEMENT PLASTER

- A. Materials:
 - 1. Portland Cement: ASTM C150/C150M, Type I.
 - a. Finish Coat: Match existing color.
 - 2. Masonry Cement: ASTM C91/C91M, Type N.
 - 3. Plastic Cement: ASTM C1328/C1328M.
 - 4. Lime: ASTM C206 Type S.
 - 5. Sand: Clean, well graded, and complying with ASTM C897.
 - 6. Water: Clean, fresh, potable, and free of mineral or organic matter that could adversely affect plaster.
 - 7. Admixture: Air entrainment type.
 - 8. Plaster Mix Reinforcement: Glass fibers, chopped to 1/2 inch nominal length, and alkali resistant.
 - 9. Color Pigment: Mineral oxide type, color to match existing.
- B. Plaster Mixes: Proportioned in accordance with ASTM C926; parts by volume.
 - 1. First Coat Over Concrete Masonry:
 - a. Plaster Mix "CL": One part Portland cement, with minimum 3/4 part and maximum 1-1/2 parts hydrated lime.
 - b. Plaster Mix "M": One part Type N masonry cement.
 - c. Plaster Mix "CM": One part Portland cement, and one part Type N masonry cement.
 - d. Plaster Mix "MS": One part Portland cement, and one part Type M or Type S masonry cement.
 - e. Plaster Mix "P": One part plastic cement.
 - f. Minimum 2-1/2 parts and maximum 4 parts sand, per total volume of cementitious materials.
 - g. Fiber reinforcement at 1-1/2 lbs per sack of cement.
 - 2. Second Coat: Same mixture as first coat, without fiber reinforcement, except minimum 3 parts and maximum 5 parts sand.
 - 3. Finish Coat:
 - a. Plaster Mix "F": One part Portland cement, with minimum 3/4 part and maximum 1-1/2 parts hydrated lime.
 - b. Plaster Mix "FL": One part Portland cement, with minimum 1-1/2 parts and maximum 2 parts hydrated lime.
 - c. Plaster Mix "FM": Type N masonry cement.
 - d. Plaster Mix "FCM": One part Portland cement, and one part Type N masonry cement.
 - e. Plaster Mix "FMS": One part Type M or Type S masonry cement.
 - f. Plaster Mix "FP": One part plastic cement.
 - g. Minimum 1-1/2 parts and maximum 3 parts sand, per total volume of cementitious materials.

2.3 ACCESSORIES

- A. Beads, Screeds, and Joint Accessories: As specified in Section 09 2236.

- B. Bonding Compound: Provide type recommended for bonding plaster to solid surfaces, complying with ASTM C932.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.
- B. Verify masonry joints are flush and surfaces are ready to receive work of this section, and that there are no existing bituminous or water repellent coatings on masonry surfaces.
- C. Verify mechanical and electrical equipment and services located within areas to receive this work have been properly tested and approved.

3.2 PREPARATION

- A. Dampen masonry surfaces to reduce excessive suction.
- B. Clean concrete surfaces of foreign matter using approved acid solutions, solvents, or detergents, and then rinse surfaces thoroughly with clean water.
- C. Roughen smooth concrete surfaces and apply bonding compound in accordance with manufacturer's written installation instructions.

3.3 MIXING

- A. Mix only as much plaster as can be used prior to initial set.
- B. Mix materials dry, to uniform color and consistency, before adding water.
- C. Add air entrainment admixtures to each coat to provide 5 to 7 percent air entrainment.
- D. Do not retemper mixes after initial set has occurred.
- E. Protect mixtures from frost or freezing temperatures, contamination, and excessive evaporation.

3.4 APPLICATION

- A. Apply plaster in accordance with manufacturer's written instructions and comply with ASTM C926.
- B. Base Coats:
 - 1. Follow guidelines in ASTM C926 and manufacturer's written installation instructions for moist curing base coats and application of subsequent coats.
- C. Leveling Coat:
 - 1. Apply leveling coat to specified thickness.
- D. Finish Coats:
 - 1. Cement Plaster:
 - a. Apply with sufficient material and pressure to ensure complete coverage of base.
 - b. Apply desired surface texture while mix is still workable.
 - c. Float to a consistent finish.
 - 2. Primer and Acrylic Coatings:
 - a. Remove surface contaminants such as dust and dirt without damaging substrate.
 - b. Apply primer in accordance with manufacturer's instructions.
 - c. Apply finish coating in number of coats and to thickness recommended by manufacturer.

3.5 TOLERANCES

- A. Maximum Variation from True Flatness: 1/4 inch in 10 feet.

3.6 REPAIR

- A. Patching: Remove loose, damaged or defective plaster and replace with plaster of same composition; finish to match surrounding area.

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END OF SECTION

**SECTION 09 2900
GYPSUM BOARD**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Tile backing panels.
- B. Related Requirements:
 - 1. Section 06 16 53 "Gypsum Sheathing" for gypsum sheathing for exterior walls.
 - 2. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.2 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of gypsum board product, including related accessories. Furnish a material list with technical data documenting the location and primary function, quality, and performance of each material component or system to be used in the Work, or other such primary characteristics as required by the Drawings or Specifications.
 - 1. Submit manufacturer's technical data for each gypsum drywall partition and each ceiling system.
- B. Shop Drawings: Show locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover, keep them dry, and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
 - 1. Conform to applicable code for fire rated assemblies. Construct assemblies to achieve fire resistance ratings indicated on Drawings in accordance with UL, GA, or other acceptable tested approved assemblies. Where no test number is referenced, utilize and submit a tested approved assembly that achieves the fire rating required by the Drawings, including the Life Safety Plan.
 - 2. Assemblies listed do not necessarily indicate all assemblies that may be used in this project. Contractor may propose alternate UL listed assemblies that meet the same requirements to the Architect for consideration. Contractor may not substitute assemblies without written authorization by the Architect.

3. Drawings, keys or written descriptions located in the Contract Documents to describe fire rated assemblies for beams, floors, roofs, columns, walls, partitions and through-penetration firestop systems do not necessarily call out each and every specific requirement of the designated UL listed or other approved tested assembly identified. It is the Contractor's responsibility to become thoroughly familiar with the corresponding requirements published in the most recent issue of the Underwriters Laboratories Inc. Fire Resistance Directory and construct the fire rated assemblies in strict accordance with those requirements and conforms to assemblies indicated on Drawings.
 4. Prescribed UL Design Numbers or other tested design which may be called for on this Project and may be required as determined during the construction process if existing conditions dictate. The UL assemblies or other tested designs indicated in the Contract Documents are not intended to represent all rated conditions designated in the Contract Documents or those that may be considered viable alternates (where approved by Architect). UL listed fire rated assemblies include, but are not limited to the following:
 - a. Wall Systems: Refer to Drawings.
 - b. Fire-Resistive Joint Systems and Through-Penetrations Firestop Systems: Refer to Section 07 8400 "Firestopping."
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Gypsum.
 2. CertainTeed Corporation.
 3. Georgia-Pacific Building Products.
 4. National Gypsum Company.
 5. PABCO Gypsum.
 6. USG (EcoSmart gypsum board products are acceptable).
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
1. Thickness: 5/8 inch.
 2. Long Edges: Tapered.

2.4 SPECIALTY GYPSUM BOARD

- A. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Georgia-Pacific Gypsum LLC; DensArmour Plus.
 - b. National Gypsum Company, eXP Interior Extreme.
 - c. USG Corporation; Sheetrock Glass-Mat Panels Mold Tough.
 2. Core: 5/8 inch, Type X.
 3. Long Edges: Tapered.
 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corp.; Diamondback GlasRoc Tile Backer.

- b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
- c. National Gypsum; eXP Tile Backer.
- d. USG Corporation; Durock Glass-Mat Tile Backer Boards.
- 2. Core: 5/8 inch, Type X.
- 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.6 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - e. Expansion (control) joint.

2.7 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Glass-Mat Gypsum Board: 10-by-10 glass mesh.
 - 3. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.
- D. Joint Compound for Tile Backing Panels:
 - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

2.8 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Electrical Box Pads: Putty Pads: Moldable non-curing one component, intumescent, fire-rated material for through-penetration fire stop systems and sound attenuation systems; self-adhering; 1/8 inch thick minimum.
 - 1. Acceptable Product: CP 617 as manufactured by Hilti Incorporated.
- D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
 - 2. Thickness / STC Rating: As scheduled on Drawings.
 - 3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed; Sound Control Batts or Fire Batts.

- b. Johns Manville Sound Control Batts or Fire Batts.
 - c. Knauf Insulation; EcoBatt with ECOSE Technology
 - d. Owens Corning Company, SAB.
 - e. Roxul Inc.; Acoustical Fire Batts.
 - f. Thermafiber, Inc.; an Owens Corning Company, SAFB.
- E. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
 - b. Grabber Construction Products; Acoustical Sealant GSC.
 - c. Hilti Incorporated; CP 506 Smoke and Acoustic Sealant.
 - d. Pecora Corporation; AC-20 FTR.
 - e. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
 - f. Tremco; Acoustical Sealant.
 - g. USG Corporation; SHEETROCK Acoustical Sealant.
 - h. No Substitutions Allowed.
 - 2. Sealant shall have a VOC content of 250 g/L or less.
- F. Acoustic Joint Spray: Provide manufacturer's standard sprayable latex material complying with ASTM C919 and the following:
- 1. Spray effectively reduces airborne sound transmission through head-of-wall joints in building construction as demonstrated by testing representative assemblies in accordance with ASTM E90.
 - 2. Acoustical Spray to maintain STC ratings at sound rated partitions as indicated on the drawings.
 - 3. Spray has flame-spread and smoke-developed ratings of less than 25 as tested in accordance with ASTM E84.
 - 4. Spray is mold and mildew resistant per ASTM G21.
 - 5. Spray has movement capability of minimum 12.5%.
 - 6. Proposed acoustic spray materials and methods shall conform to applicable governing codes having local jurisdiction.
 - 7. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hilti Incorporated; CP 572 Smoke and Acoustic Spray.
- G. Thermal Insulation: As specified in Section 07 21 00 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. STC-Rated and Smoke Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- I. Install electrical box pads after gypsum panels have been installed on one side. Comply with manufacturer instructions.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: Vertical surfaces unless otherwise indicated.
 - 2. Glass-Mat Interior Type:
 - a. Interior side (face) of exterior walls.
 - b. Interior partitions where Contractor desires to install gypsum board prior to building dry-in.
 - c. At urinal and toilet fixtures as indicated on Drawings.
 - 3. Tile Backer-Glass-Mat Type:
 - a. Walls in toilet room with shower.
 - b. Tiled walls in showers.
 - c. Tiled walls in restrooms and kitchens.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - 3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions. Install with 1/4-inch gap where panels abut other construction or penetrations.

1. Where tile backing panels abut other types of panels in the same plane, shim surfaces to produce a uniform plane across panel surfaces.
2. Do not install screws within 6 inches of the shower wall base so as to not penetrate shower pan waterproofing.

3.5 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 1. Cornerbead: Use at outside corners.
 2. LC-Bead: Use at exposed panel edges.
 3. L-Bead: Use where indicated.
 4. U-Bead: Use at exposed panel edges and where indicated.

3.6 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 2: Panels that are substrate for tile.
 3. Level 3: Mechanical Rooms, Electrical Rooms, and similar spaces.
 4. Level 4: At panels in all locations except where, another level of finish is specified.
 5. Level 5: At exposed locations utilizing glass mat interior gypsum board products and where required by another specification Section as preparation of wall and at panel surfaces receiving gloss and semigloss enamels and other surfaces subject to severe lighting.
- E. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.7 PARTITION IDENTIFICATION

- A. Wall Identification: Permanently label all fire-rated walls and smoke partition assemblies with the partition identification as defined below using lettering not less than 3 inches (76 mm) high and with minimum 0.375-inch (9.5-mm) strokes.
 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet (4.57 m) from end of wall and at intervals not exceeding 30 feet (9.14 m).
 2. Partition Identification Text: Apply the following according to partition ratings on Drawings, and as acceptable to authorities having jurisdiction:
 - a. SMOKE PARTITION – PROTECT ALL OPENINGS.
 - b. 1-HOUR SMOKE BARRIER – PROTECT ALL OPENINGS.
 - c. 1-HOUR FIRE PARTITION – PROTECT ALL OPENINGS.
 - d. 1-HOUR FIRE BARRIER – PROTECT ALL OPENINGS.

3.8 FIELD QUALITY CONTROL

- A. Above-Ceiling Observation: Before installing gypsum board ceilings, conduct an above-ceiling inspection, and report and correct deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.
 1. Notify Architect seven days in advance of date and time when Project, or part of Project, will be ready for Contractor's above-ceiling inspection. Provide Architect with copy of deficiencies

- report. Architect reserves the right to supplement Contractor's deficiency report with other incomplete or incorrect items that might be observed during Architect's site visit.
2. Before notifying Architect, complete the following in areas to receive gypsum board ceilings:
- a. Installation of 80 percent of lighting fixtures, powered for operation.
 - b. Installation, insulation, and leak and pressure testing of water piping systems.
 - c. Installation of air-duct systems.
 - d. Installation of air devices.
 - e. Installation of mechanical system control-air tubing.
 - f. Installation of ceiling support framing.
 - g. Touch-up / patching of spray fire-resistive materials (SFRM).
 - h. Installation of penetration firestopping in fire- and smoke-rated partitions.
 - i. Installation of fire-resistant joint sealants in fire-rated partitions.
 - j. Installation of acoustical sealants at adjacent sound-rated partitions.
 - k. Application of fire- and smoke-rated partition identification.

3.9 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 09 3000
TILING**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Porcelain tile
 - 2. Thresholds
 - 3. Waterproof membrane
 - 4. Crack-isolation membrane

1.2 DEFINITIONS

- A. General: Definitions in the ANSI A108 Series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. Module Size: Actual tile size plus joint width indicated.
- C. Face Size: Actual tile size, excluding spacer lugs.
- D. Wet Area: Tile surfaces that are either soaked, saturated, or regularly and frequently subjected to moisture and liquids (including water), such as gang showers, tub enclosures, showers, laundries, saunas, steam rooms, swimming pools, hot tubs, and exterior areas.

1.3 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028.
 - 1. Level Surfaces: Minimum 0.6 – Wet
- B. Dynamic Coefficient of Friction: For tiles installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM A 137.1:

1.4 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: Not required.
- C. Shop Drawings:
 - 1. Show locations of each type of tile and tile pattern.
 - 2. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and in finished tile surfaces.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit letter stating that products will be provided per Owner's Bulk Purchasing List.

1.6 CLOSEOUT SUBMITTALS

- A. Include maintenance and product data for all items installed.
- B. Tile installation system warranty. Contractor shall obtain required information to meet manufacturers' claim requirements, i.e., proof of purchase, Installer information and any additional requirements.

1.7 MAINTENANCE MATERIALS SUBMITTALS

- A. Supply extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Verify Installer is qualified and approved by Manufacturer/Supplier, with minimum five years of continuous, uninterrupted experience in successfully installing work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who agrees to employ only skilled tradesmen with minimum five years' experience.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer verifying tile has been produced to meet requirements for ANSI 137.1.
- C. Product Certificates: For each type of product, signed by product manufacturer.
- D. Material Test Reports: For each tile-setting and grouting product.
- E. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- F. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- G. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 1. Waterproof membrane
 2. Crack isolation membrane

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer recommendations.

PART 2 -PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 1. Provide tile complying with Standard grade requirements unless otherwise indicated.

- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. In-Field Blending: For tile exhibiting color variations within ranges approved during Sample submittals, Installer shall blend tile in field by pulling tiles from several different packages to blend colors and to match Architect approved Samples.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - 1. Where tile is indicated for installation in swimming pools, on exteriors or in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.
- E. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of temporary protective coating specified by tile manufacturer. Do not coat unexposed tile surfaces.

2.2 TILE PRODUCTS

- A. For each tile type, manufacturer, series, color and sizes, see Finish Materials Listing in Finish Drawings. Also see preferred vendor list for manufacturers that may be considered acceptable substitutions and must be submitted in accordance with Division 01 section "product requirements".
- B. Waterproofing membranes, crack isolation membranes, setting materials and grout materials are part of a warranted tile installation system. Coordinate requirements for warranty with manufacturer. Large installations require a job-specific warranty.

2.3 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent hard surface floor finishes at specified door openings. See Floor Transition Details in Finish Drawings.
 - 1. Bullnose Type: Rounded edges, minimum 1/8-inch radius.
 - 2. Beveled Edge Type: Maximum 1:2 slope, with lower edge of bevel aligned with or up to 1/16-inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/4-inch or less above adjacent floor surface.
- B. Solid-Surfacing Material Thresholds: Homogeneous solid strips of filled plastic resin complying with ISSFA-2. Provide Standard type.
 - 1. See Finish Materials Listing and Floor Transition Details in the Finish Drawings.

2.4 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product, selected from the following that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

2.5 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 3/16-inch nominal thickness.

2.6 SETTING MATERIALS

- A. Dry-Set Portland Cement Mortar (Thin-Set and Medium-Bed) ANSI 118.1: Provide at locations to receive uncoupling membrane.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Custom Building Products; Uncoupling Mat Mortar
 - b. Laticrete International, Inc.; No. 317
 - c. MAPEI Corporation; Keraset
 - d. TEC; a subsidiary of H.B. Fuller Company; Full Set Plus
- B. Latex-Portland Cement Mortar (Thin-Set and Medium-Bed): ANSI A118.4
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Custom Building Products; FlexBond Crack Prevention Mortar
 - b. Laticrete International, Inc.; No. 254R Platinum
 - c. MAPEI Corporation; Ultraflex 3
 - d. TEC; a subsidiary of H.B. Fuller Company; FortiFlex 2
 - e. TEC; a subsidiary of H.B. Fuller Company; Super Flex - white at glass tile locations
 - 2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

2.7 GROUT MATERIALS

- A. Polymer-Modified Tile Grout: ANSI A118.7
 - 1. Products: Subject to compliance with requirements, see Finish Material Listing for Basis of Design. Also see preferred vendor list for manufacturers that may be considered acceptable substitutions and must be submitted in accordance with Division 01 Section "product requirements".
- B. Water-Cleanable Epoxy Grout: ANSI A118.3.
 - 1. Products: Subject to compliance with requirements, see Finish Material Listing for Basis of Design. Also see preferred vendor list for manufacturers that may be considered acceptable substitutions and must be submitted in accordance with Division 01 Section "product requirements".

2.8 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for warranted installation systems indicated.
- B. Metal Edge Strips: See Floor Transition Details in the Finish Drawings.
- C. Temporary Protective Coating: Product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - 1. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- E. Grout Sealer: As recommended by grout manufacturer that does not change color or appearance of grout.

2.9 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.

- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean, free of oil, waxy films, soap, silicones, and curing compounds; maximum variation in the plane or slope – 1/8-inch in 10-ft.
 - 2. Verify that concrete substrates for tile floors installed with bonded mortar bed or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer, which maintains tile installation systems warranty.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.
- C. Blending: For tile exhibiting color variations, install to blend tile from 2 or 3 boxes.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE INSTALLATION

- A. Comply with TCNA "Handbook for Ceramic Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas
 - b. Tile floors composed of tiles 8 by 8 inches or larger
 - c. Tile floors composed of rib-backed tiles
- B. Variation in Surface Plane of Large Format Flooring: Do not exceed 1/8 inch in 10 feet from level or slope indicated when tested with a 10-foot straightedge.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

- E. Provide manufacturers' standard trim shapes where necessary to eliminate exposed tile edges.
- F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- G. Joint Widths: See Finish Materials Listing in the Finish Drawings.
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
 - 3. Furnish and install movement joints per TCNA Handbook – movement joints EJ171.
 - 4. Contractor to coordinate location of control and isolation joints with Architect upon observation at site.
- J. Thresholds: Install thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
 - 1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-Portland cement mortar (thin set).
 - 2. Do not extend cleavage membrane, waterproofing or crack isolation membrane under thresholds set in dry-set Portland cement or latex-Portland cement mortar. Fill joints between such thresholds and adjoining tile set on cleavage membrane, waterproofing or crack isolation membrane with elastomeric sealant.
- K. Metal Edge Strips: Install at locations indicated.
- L. Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer recommendations. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- M. Expansion and Control Joint Locations: Comply with TCNA recommendations for size and construction.
 - 1. Expansion and control joints in substrates.
 - 2. Where indicated on Drawings.
 - 3. Where not shown on Drawings, comply with spacing requirements recommended in TCNA Handbook. Mark proposed locations on copies of floor plans and obtain Architect's approval.

3.4 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer recommendations to produce membrane of uniform thickness and bonded securely to substrate.
 - 1. In areas of new construction or existing construction 5 years old or less specified to receive thin-set floor tile system, install membrane continuous over flooring substrate, from wall to wall.
 - 2. In areas of existing construction more than 5 years old specified to receive a new thin-set floor tile system, install membrane as per manufacturer's recommended width centered over and running parallel with existing cracks in flooring substrate.
- B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.5 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer recommendations. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.6 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
 - 1. Tile Installation F111-12 (Dry Floors): Cement mortar bed (thick-set) with cleavage membrane; TCA F111-12 and ANSI A108.1C
 - a. Thin-Set Mortar for Cured-Bed Method: Medium-bed, latex-Portland cement mortar
 - b. Grout: Polymer-modified grout
 - 2. Tile Installation F121-12 (Wet Floors): Cement mortar bed (thick-set) on waterproof membrane; TCA F121 and ANSI A108.1C
 - a. Thin-Set Mortar for Cured-Bed Method: Latex-Portland cement mortar. Provide medium-bed at all locations with 12" or larger tiles.
 - b. Grout: Water cleanable epoxy grout.
 - 3. Tile Installation F125-12 (Dry Floors): Thin-set mortar on crack isolation membrane – partial coverage; TCA F125-Partial-12.
 - a. Thin-Set Mortar: Latex-Portland cement mortar. Provide medium-bed at all locations with 12" or larger tiles.
 - b. Grout: Polymer-modified grout
- B. Interior Wall Installations, Metal Studs or Furring:
 - 1. Tile Installation W243-12 (Dry Walls): Thin-set mortar on gypsum board; TCA W243-12
 - a. Thin-Set Mortar: Latex-Portland cement mortar
 - b. Grout: Polymer-modified grout
 - 2. Tile Installation W245-12 (Wet Walls): Thin-set mortar on coated glass-mat, water-resistant gypsum backer board; TCA W245-12.
 - a. Thin-Set Mortar: Latex-Portland cement mortar
 - b. Grout: Water-cleanable epoxy grout

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END OF SECTION

**SECTION 09 5113
ACOUSTICAL PANEL CEILINGS**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Acoustical ceiling panels.
- B. Products supplied, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.2 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: Not required.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.
- B. Warranty Information: For products specified.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Supply extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Panels: One full carton for each product type of tile used in the project.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Acceptable to ceiling system Manufacturers, knowledgeable in proper use and handling of materials specified herein, with minimum 10 years of continuous, uninterrupted experience in successfully installing work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who agrees to employ only skilled tradesmen for the Work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach a uniform room operating temperature and a stabilized moisture content as per manufacturer's recommendations.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.9 WARRANTY

- A. Warranties: General and special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and are in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
 - 1. Pass-through warranties provided by subcontractors to manufacturer are not acceptable.
- B. Acoustical Panel Ceilings: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
 - 1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
 - 2. Grid System: Rusting and manufacturer's defects.
 - 3. Acoustical Panels Designated as Inherently Resistive to the Growth of Micro-Organisms: Visible sag and will resist the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
- C. Warranty Period:
 - 1. Acoustical Panels: Ten years from date of Substantial Completion.
 - 2. Grid: Ten years from date of Substantial Completion.
 - 3. Acoustical Panels and Grid Systems Designated as Inherently Resistive to the Growth of Micro-Organisms: Thirty years from date of Substantial Completion.

PART 2 -PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials and with a flame-spread of 25 or less.
 - 2. Smoke-Developed Index: 50 or less.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL "Fire Resistance Directory" or from listings of another qualified testing agency.

2.2 ACOUSTICAL PANELS, GENERAL

- A. Low-Emitting Materials: Acoustical panel ceilings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Source Limitations:
 - 1. Acoustical Ceiling Panel and Suspension System: Obtain from single source from single manufacturer.
- C. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

- D. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.
- E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type as listed in the drawings.
- F. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.3 ACOUSTICAL PANELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products from manufacturer's listed HCA's "Preferred Vendors List" in Document 00 2150 and the standard panel of configuration indicated on Contract Drawings or in Specifications, relative to panel size, thickness, texture, pattern, color, and other characteristics.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
 - 1. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated or anticipated.
- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
 - b. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchor.
 - c. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B 164 for UNS No. N04400 alloy.
 - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.
- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.
 - 3. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch-diameter wire (No. 12 Gage) minimum.
- E. Hanger Rods and/or Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

- F. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch- (1-mm-) thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch-diameter bolts.

2.5 METAL SUSPENSION SYSTEM

- A. Subject to compliance with requirements, provide manufacture's standard grid system indicated in the Products Legend on the Reflected Ceiling Plan relative to grid profile/size and other characteristics. Installer to verify that the specified panel and grid system are compatible before installation of grid begins.
1. Metal Edge Moldings and Trim: Subject to compliance with requirements, provide the products indicated in the Products Legend on the Reflected Ceiling Plan relative to metal edge moldings profile/size and other characteristics or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal or aluminum, of same material, finish, and color as that used for exposed flanges of suspension system runners.
- B. Exposed Tee Ceiling Systems:
1. Wide-Face (15/16-inch), Capped, Double-Web, Hot-Dip Galvanized Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation, prepainted, with prefinished cold rolled 15/16-inch-wide steel caps on flanges. Provide fire-resistance rated system where required.
 - a. Structural Classification: Intermediate-duty system, or greater as otherwise required to comply with seismic regulations.
 - b. Cross Tee/Main Beam Interface: Flush fit
 - c. Face Design: Flat
 - d. Cross Tee End Connection: "Stab T"
 - e. Cap Finish: White unless noted otherwise. See Reflected Ceiling Plan.

2.6 ACOUSTICAL SEALANT

- A. Products: Subject to compliance with requirements, provide one of the following:
1. Acoustical Sealant for Exposed and Concealed Joints: Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. USG Corporation; SHEETROCK Acoustical Sealant USG Corporation; SHEETROCK Acoustical Sealant.
 2. Acoustical Sealant for Concealed Joints: Acoustical Sealant for Concealed Joints:
 - a. Henkel Corporation; OSI Sealants Pro-Series SC-175 Rubber Base Sound Sealant Henkel Corporation; OSI Sealants Pro-Series SC-175 Rubber Base Sound Sealant.
 - b. Pecora Corporation; AIS-919 Pecora Corporation; AIS-919.
 - c. Tremco, Inc.; Tremco Acoustical Sealant Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.
 2. Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant.

2.7 MISCELLANEOUS MATERIALS

- A. Acoustical Tile Adhesive: Type recommended by acoustical tile manufacturer, bearing UL label for Class 0-25 flame spread.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected in a manner acceptable to the Installer, and in compliance with manufacturer's warranty requirements.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
- B. Sprayed Fire-Resistive Materials: Coordinate the installation of acoustical panel ceiling assemblies with the applied fireproofing so both elements of Work remain complete and undamaged. Patch or replace applied fire-resistive materials removed or damaged during installation of acoustical panel ceilings assemblies. Comply with requirements specified in Division 07 Section "Applied Fireproofing."
- C. After sprayed fire-resistive materials are applied, remove only to extent necessary for installation of wire hanger brackets and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer recommendations and CISCA publication "Ceiling Systems Handbook."
 - 1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling-suspension members and to supports above with minimum four tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 - 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.

7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 8. Do not attach hangers to steel deck tabs.
 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 10. Space hangers maximum 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers maximum 8 inches from ends of each member.
 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 12. Verify the maximum length and size of anchors with structural engineer.
- C. Secure bracing wires to ceiling suspension members and to supports with minimum four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals maximum 16 inches o.c. and maximum 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.
 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
 4. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer recommendations for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

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END OF SECTION

**SECTION 09 6513
RESILIENT BASE AND ACCESSORIES**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient cove base.
 - 2. Adhesive and related accessories.
 - 3. Related Sections:
 - a. Division 09 Section "Resilient Sheet Flooring" for resilient sheet floor coverings.
 - b. Division 09 Section "Resilient Tile Flooring" for resilient floor tile.

1.2 ACTION SUBMITTALS

- A. Submit items in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each type of product indicated, submit two (2) copies of manufacturers' product data, installation instructions, and accessories specified and/or required by manufacturer.
- C. Samples for Verification: Submit two (2) samples for each type of product indicated in manufacturer's standard-size, but not less than 12 inches long, of each resilient product color, texture, and pattern required.
- D. Product Schedule: See Finish Material Listing in Finish Drawings.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials/attic stock that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Concrete Sealer Installer Qualifications: Installer trained and certified by sealer manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 -PRODUCTS

2.1 RESILIENT COVE BASE

- A. Resilient Cove Base:
 - 1. Manufacturers: Subject to compliance with requirements, see Finish Material Listing for Basis of Design. See Preferred Vendor List for manufacturers that may be considered acceptable substitutions and must be submitted in accordance with Division 01 Section "Product Requirements."
- B. Resilient Base Standard: ASTM F1861
 - 1. Material Requirement: Type TS (rubber, vulcanized thermoset)
 - 2. Manufacturing Method: Group I (solid, homogeneous)
 - 3. Style: See Finish Material Listing in Finish Drawings.
- C. Minimum Thickness: See Finish Material Listing in Finish Drawings.
- D. Height: See Finish Material Listing in Finish Drawings.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Finish Colors and Patterns: See Finish Material Listing in Finish Drawings.

2.2 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - a. Sweep and vacuum surfaces thoroughly.
 - b. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from marks, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

ISSUED:	DATE:
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 09 6516
– RESILIENT SHEET FLOORING**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl sheet floor covering, with and without backing
 - 2. Adhesive and related accessories
 - 3. Surface-applied moisture mitigation and related products
- B. Related Sections:
 - 1. Division 09 Section "Resilient Base and Accessories" for resilient base, reducer strips, and other accessories installed with resilient floor coverings.
 - 2. Division 09 Section "Resilient Tile Flooring" for resilient floor tile.

1.2 SEQUENCING

- A. Install sheet flooring after other finishing operations, including painting, have been completed.
- B. Install sheet flooring before installation of base cabinets.

1.3 ACTION SUBMITTALS

- A. Submit items in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each type of product indicated, submit two (2) copies of manufacturers' product data, installation instructions and accessories specified and/or required by manufacturer.
- C. Shop Drawings: Submit Drawings for each type of floor covering. Include floor covering layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns, type, locations and direction. See Finish Drawings.
 - 2. Transition details to other floor materials.
- D. Samples for Verification: Submit two samples of each specified color of flooring. If products other than those specified are proposed, provide a sample of the specified item with the proposed sample. Label samples with finish designations included on the Finish Legend (SVF- 1, SRF-2, etc.) - failure to label as such will be cause for rejection of the submittal for the entire Section. Note: if the submitted items are not the specified items, not matching the specified colors will be cause for rejection of the submittal for this Section. Submit samples in the following minimum sizes:
 - 1. Sheet Goods: 4 x 4 inch.
 - 2. Welding rods: 4 inches long.
- E. Seam Samples: For each flooring product, provide a seam running lengthwise and in center, and one inside and one outside corner of integral base. Sample to be on rigid backing and prepared by Installer for this Project.
- F. Product Schedule: See Finish Materials Listing in Finish Drawings.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor covering, provide maintenance manuals including manufacturers' written instructions for cleaning and maintenance.
- B. Manufacturers' warranties.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials/attic stock that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Covering: Furnish quantity not less than 10 linear feet for every 500 linear feet or fraction thereof, in roll form and in full roll width for each color, pattern, and type of floor covering installed.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer with no less than three years' experience who employs workers for this Project who are competent in heat welding techniques required by manufacturer for floor covering installation with similar and successful installations within the last year. Provide documentation if requested.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor covering manufacturer for installation techniques required.
- B. Installer Qualifications: Concrete Vapor Sealer: Acceptable to manufacturer and employing factory-trained installers.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor coverings and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store rolls upright.

1.8 PROJECT CONDITIONS

- A. Maintain ambient temperatures and humidity level within range recommended by manufacturer, but not less than 70 deg F or more than 85 deg F, in spaces to receive floor coverings during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures and humidity level within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to foot traffic for 48 hours and to rolling traffic for 72 hours after floor covering installation.
- E. Install floor coverings after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 64 OR NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL SHEET FLOOR COVERING

- A. Products: Subject to compliance with requirements, see Finish Materials Listing for Basis of Design and HCA Preferred Vendor List for acceptable manufacturer.
- B. Unbacked Vinyl Sheet Floor Covering: ASTM F 1913, **0.080 inch** thick.

- C. Wearing Surface: Smooth with embedded abrasives or Embossed with embedded abrasives. See Finish Materials Listing in Finish Drawings.
- D. Sheet Width: See Finish Materials Listing in Finish Drawings.
- E. Seaming Method: Heat welded
- F. Colors and Patterns: See Finish Materials Listing in Finish Drawings.

2.3 INSTALLATION MATERIALS

- A. Substrate Preparation Products:
 - 1. Trowelable Leveling and Patching Compounds: Portland cement-based or blended hydraulic cement-based formulation provided or approved by floor covering manufacturer for applications indicated. Products for manufacturers' consideration are Ardex SP-F Feather Finish (patching), K-15 (leveling) or Concure Feather Cement (patching), SL-1 (leveling).
 - 2. For Concrete Testing Over 90% RH:
 - a. Moisture Mitigation Products - Concure Vapor Barrier Two-Step System; Concure Corporation, Collingdale, PA. Or select from approved alternates.
 - 1) Ardex Rapid MC; Ardex Americas, Aliquippa, PA.
 - 2) Koster vap I 2000; Koster American Corporation, Virginia Beach, VA.
 - 3) Moisture Mitigation; Stauf USA, Arlington, TN.
 - b. Adhesive - utilize a pre-applied, poly-acrylic adhesive system - EnviroSTIX (all resilient flooring types); Base King, Dalton GA.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor covering and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of not more than 50 or 60 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 - 3. Refer to HCA / HPG Recommended Adhesive Chart for each type of resilient flooring. Contact the HCA National Account-Mannington Commercial rep for the most current chart:
Terri Bailey
terri_bailey@mannington.com
(615) 427-8980
- C. Seamless-Installation Accessories:
 - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
 - a. Color: As selected by Architect/Interior Designer from manufacturer's full range to contrast with floor covering.
- D. Integral-Flash-Cove-Base Accessories:
 - 1. Cove Strip: 3/4-inch radius provided or approved by manufacturer.
 - 2. Cap Strip: Square metal or Rubber cap provided or approved by manufacturer.
 - 3. Corners: Metal inside and outside corners and end stops provided or approved by manufacturer.
 - 4. Joint Sealant: Apply sealant at top of integral base.
- E. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content, moisture vapor emission, temperature, alkalinity, installation tolerance, moisture mitigation, and other conditions affecting performance of the Work.

- B. At areas which require moisture mitigation, brush blasting, bead blasting, shot blasting, scarifying or other substrate preparation, consult with Architect and Structural Engineer prior to performing Work.
- C. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor coverings.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of floor coverings.
- B. Concrete Substrates: Prepare according to ASTM F710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after all substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate allowed by manufacturer(s) for each product specified in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum relative humidity level measurement allowed by manufacturer(s) for each product specified.
 - c. If required, apply the moisture mitigation product per the manufacturer's recommendations and provide any additional calcium chloride testing of the prepared substrate per moisture mitigation manufacturer's recommendations prior to installation of floor covering and register results with the moisture mitigation manufacturer, General Contractor, Owner and Architect.
 - 5. After installation of vapor sealer and before flooring installation, conduct 72 - hour bond test to verify adhesion of each required type of flooring adhesive to concrete vapor sealer. Provide written report on such testing.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor coverings until they are same temperature as space where they are to be installed.
 - 1. Move floor coverings and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation.

3.3 FLOOR COVERING INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor coverings.
- B. Unroll floor coverings and allow them to stabilize before cutting and fitting.
- C. Lay out floor coverings as follows:
 - 1. As indicated in Finish Drawings.
 - 2. Maintain uniformity of floor covering direction.
 - 3. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in floor covering substrates.
 - 4. Match edges of floor coverings for color shading at seams.
 - 5. Avoid cross seams.

- D. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor coverings on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of floor coverings installed on covers and adjoining floor covering. Tightly adhere floor covering edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor coverings to substrates using an application of adhesive applied as directed in manufacturer's installation instructions. Follow instructions to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing marks, and other surface imperfections.
- I. Seamless Installation:
 - 1. Heat-Welded Seams: Comply with ASTM F1516. Rout joints and use welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces.
 - 2. Vinyl Tile to Sheet Vinyl Transitions: Heat-Weld all joints between Vinyl Tile and Sheet Vinyl.
 - 3. Apply Seam Coater Pen. The Quantum Guard HP Pen is to provide topical protection to heat-welded seams.
- J. At areas receiving integral base, extend flooring material or pre-molded base up the wall to the height indicated on the drawings. Carefully miter corners and heat seal seams. The cut style at mitered corners must be consistent throughout entire project (boot or butterfly).
 - 1. Install integral base cove cap. Clean thoroughly and apply sealant between the cove cap and wall and to bottom of door frame to floor. See Division 07 Section "Joint Sealants."
- K. Protect flooring installations and do not allow walking traffic for 24 hours or rolling loads for 72 hours after completion of installation to allow for setting and drying of adhesive.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor coverings.
- B. Perform the following operations immediately after completing floor covering installation:
 - 1. Remove adhesive and other blemishes from floor covering surfaces.
 - 2. Sweep and vacuum floor coverings thoroughly.
 - 3. Damp-mop floor coverings to remove marks and soil.
- C. Protect floor coverings from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor covering before applying liquid floor polish.
 - 1. Apply floor polish per manufacturers' recommendation.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 09 6519
RESILIENT TILE FLOORING**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid (Luxury) vinyl floor tile
 - 2. Adhesive and related accessories
- B. Related Sections:
 - 1. Division 09 Section "Resilient Base and Accessories" for resilient base, reducer strips, and other accessories installed with resilient floor coverings.
 - 2. Division 09 Section "Resilient Sheet Flooring" for resilient sheet floor coverings.

1.2 SEQUENCING

- A. Install floor tile after other finishing operations, including painting, have been completed.
- B. Install floor tile before installation of base cabinets.

1.3 ACTION SUBMITTALS

- A. Submit items in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each type of product indicated, submit two (2) copies of manufacturers' product data, installation instructions and accessories specified and/or required by manufacturer.
- C. Shop Drawings: Submit Drawings for each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns, type, locations and direction. See Finish Drawings.
 - 2. Transition details to other flooring materials.
- D. Samples for Verification: Submit two samples of each specified color of floor tile. If products other than those specified are proposed, provide a sample of the specified item with the proposed sample. Label samples with finish designations included on the Finish Legend (VT-1, LVT-2, etc.) - failure to label as such will be cause for rejection of the submittal for the entire Section.
 - 1. Tiles: 4 x 4 inch
 - 2. Welding rods: 4 inches long
- E. Product Schedule: See Finish Material Listing in Finish Drawings.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile, provide maintenance manuals including manufacturers' written instructions for cleaning and maintenance.
- B. Manufacturers' warranties.

1.5 MATERIALS MAINTENANCE SUBMITTALS

- A. Furnish extra materials/attic stock that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.8 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to walking traffic for 48 hours and to rolling traffic for 72 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 -PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 64 OR NFPA 253 by a qualified testing agency.
 1. Critical Radiant Flux Classification: Class I, not less the 0.45 W/sq. cm.

2.2 SOLID (LUXURY) VINYL FLOOR TILE

- A. Products: Subject to compliance with requirements, see Finish Material Listing for Basis of Design. Also see Preferred Vendor List for manufacturers that may be considered acceptable substitutions and must be submitted in accordance with Division 01 Section "Product Requirements."
- B. Tile Standard: ASTM F1700
- C. Size, Seaming Method, Colors and Patterns: See Finish Material Listing in Finish Drawings.

2.3 INSTALLATION MATERIALS

- A. Substrate Preparation Products:
 1. Trowelable Leveling and Patching Compounds: Portland cement-based or blended hydraulic cement-based formulation provided or approved by floor covering manufacturer for applications indicated. Products for manufacturers' consideration are Armstrong S-184 or S-194 (leveling or patching), Ardex SP-F Feather Finish (patching), K-15 (leveling) or Concure Feather Cement (patching), SL-1 (leveling).
 2. For concrete testing over 90% RH:
 - a. Moisture Mitigation Products - Concure Vapor Barrier Two-Step System; Concure Corporation, Collingdale, PA. Or select from approved alternates:
 - 1) Ardex Rapid MC; Ardex Americas, Aliquippa, PA.
 - 2) Koster vap I 2000; Koster American Corporation, Virginia Beach, VA.
 - 3) Stauf Moisture Mitigation; Stauf USA, Arlington, TN.
 - b. Adhesives - utilize a pre-applied, poly-acrylic adhesive system - Mannington QuickStix (LVT only); Mannington Commercial, Calhoun, GA. Or select approved alternate option:
 - 1) EnviroSTIX (all resilient flooring types); Base King, Dalton GA

- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
 - 1. Adhesives shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 - 3. Refer to HCA/HPG Recommended Adhesive Chart for each type of resilient flooring. Contact the HCA National Account-Mannington Commercial rep for the most current chart:
 - 4. Terri Bailey
 - 5. terri_bailey@mannington.com
 - 6. (615) 427-8980
- C. Seamless-Installation Accessories:
 - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
 - a. Color: As selected by Architect from manufacturer's full range to contrast with floor tile.
- D. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content, moisture vapor emission, temperature, alkalinity, installation tolerance, moisture mitigation, and other conditions affecting performance of the Work.
- B. At areas which require moisture mitigation, brush blasting, bead blasting, shot blasting, scarifying or other substrate preparation, consult with Architect and Structural Engineer prior to performing Work.
- C. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after all substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of allowed / permissible by manufacturer(s) for each product specified in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have the maximum relative humidity level measurement allowed by manufacturer(s) for each product specified.
 - c. If required, apply the moisture mitigation product per the manufacturer's recommendations and provide any additional calcium chloride testing of the prepared substrate per moisture mitigation manufacturer's recommendations prior to installation of floor covering and register results with the moisture mitigation manufacturer, General Contractor, Owner and Architect.

- d. After installation of vapor sealer and before flooring installation, conduct 72 - hour bond test to verify adhesion of each required type of flooring adhesive to concrete vapor sealer. Provide written report on such testing.
- C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.
- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles as indicated in Finish Drawings.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles as indicated in Finish Drawings.
- D. Scribe, cut, seal and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using an application of adhesive applied as directed in manufacturer's installation instructions. Follow instructions to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing marks, and other surface imperfections.
- I. At areas receiving integral base, extend flooring material or pre-molded base up the wall to the height indicated on the drawings. Carefully miter corners and heat seal seams. The cut style at mitered corners must be consistent throughout entire project as approved at the pre-installation conference or as per approved mock-up.
- J. Protect flooring installations and do not allow walking traffic for 24 hours or rolling loads for 72 hours after completion of installation to allow for setting and drying of adhesive.
- K. Seamless Installation:
 - 1. Heat Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces.

2. Vinyl Tile to Sheet Vinyl Transitions: Heat-Weld all joints between Vinyl Tile and Sheet Vinyl.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.
 - 1. Verify manufacturer written instructions for floor polish.
 - 2. Apply floor polish per manufacturer's recommendation.
- E. Joint Sealant: Apply sealant to resilient tile flooring at door frames and at other joints and penetrations.
- F. Cover floor tile until Substantial Completion.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/06/2021

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END OF SECTION

**SECTION 09 6813
TILE CARPETING**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Modular carpet tile.
 - 2. Installation accessories.
- B. Related requirements:
 - 1. Section 09 6513: Resilient wall base and accessories.

1.2 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: Not required.

1.3 INFORMATIONAL SUBMITTALS

- A. Submit letter stating that products will be provided per Owner's Bulk Purchasing List.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.5 EXTRA MATERIAL

- A. Supply extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.
 - 2. Deliver usable carpet tiles to Owner. Neatly package and wrap such carpet tiles for storage protection. Do not include miscellaneous scrap pieces as part of the specified extra materials.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level. Verify Installer is approved by manufacturer, with minimum five years continuous, uninterrupted experience in successfully installing Work similar in material, design and extent to that indicated for this Project, whose Work has resulted in construction with a record of successful in-service performance, and who agrees to employ only skilled tradesmen with minimum five years' experience.
- B. Fire-Test-Response Ratings: Provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 or ASTM E648 by a qualified testing agency.
- C. Carpet shall have smoke density development of 450 or less per NBS Smoke Chamber Test NFPA 258 or ASTM E 662.
- D. Factory Runs: Produce carpet tile, of each type specified, in one factory run and from one dye lot. Guarantee colors and shades to be uniform throughout the run of material.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

- B. Store products in clean, dry storage space.

1.8 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet Work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Install carpet tile after other finishing operations, including all painting, ceilings, and any overhead work have been completed.
- E. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.9 WARRANTY

- A. Special Warranty for Carpet Tile: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: Minimum 10 years from date of Substantial Completion.

PART 2 -PRODUCTS

2.1 CARPET TILE

- A. Products: Basis of Design products and attributes are specified in Finishes List on Drawings.
 - 1. See preferred Vendor List in Document 00 2150 for manufacturers that may be considered acceptable Substitutions submitted per requirements of Section 01 2500.

2.2 INSTALLATION ACCESSORIES

- A. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
- B. Metal Edge/Transition Strips: See Floor Transition Details in the Finish Drawings.
- C. Substrate Preparation Products:
 - 1. Trowelable Leveling and Patching Compounds: Portland cement-based or blended hydraulic cement-based formulation provided or approved by floor covering manufacturer for applications indicated. Products for manufacturers' consideration are Armstrong S-184 or S-194 (leveling or patching), Ardex SP-F Feather Finish (patching), K-15 (leveling) or Concure Feather Cement (patching), SL-1 (leveling).

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.

- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
 - 2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 4. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - 5. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after all substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of allowed / permissible by manufacturers for each product specified in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have the maximum relative humidity level measurement allowed by manufacturers for each product specified.
 - c. Where testing indicates that concrete moisture exceeds flooring manufacturer recommendations, apply vapor emission treatment per Section 09 0560.
 - 6. After installation of vapor sealer and before flooring installation, conduct 72-hour bond test to verify adhesion of each required type of flooring adhesive to concrete vapor sealer. Provide written report on such testing.
- C. Proceed with installation only after substrates pass testing and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer recommendations, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer recommendations.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.
- C. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- D. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- F. Install pattern parallel to walls and borders. See Finish Drawings per patterns and layouts.
- G. Install edge strips and trim in accordance with manufacturer recommendations concealing exposed edges.
- H. Do not place furniture or heavy objects on carpeted surfaces for minimum 2 hours or until adhesive has set.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile with non-staining building material paper, hard board or plywood to comply with CRI 104, Section 16, "Protecting Indoor Installations." Do not use plastic sheeting.
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

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END OF SECTION

**SECTION 09 9100
PAINTS AND COATINGS (SHERWIN-WILLIAMS)**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Site-applied paint systems.
 - 2. Site-applied high performance coatings.
 - 3. Concrete finishes.

1.2 REFERENCE STANDARDS

- A. The following reference standard shall be used in conjunction along with additional more stringent information stated herein:
 - 1. Master Painters Institute (MPI)
 - a. MPI Architectural Painting Specification Manual

1.3 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data:
 - 1. Site-applied paint system products.
 - 2. Site-applied high performance coating products.
- C. Samples for Verification:
 - 1. For each type of paint and high-performance coating system and in each color and gloss of topcoat:
 - a. Submit two Samples on rigid backing, 8 inches square.
 - b. Step coats on Samples to show each coat required for system.
 - c. Label each coat of each Sample.
 - d. Label each Sample for location and application area.
 - 2. Include product list in closeout Submittals.

1.4 CLOSEOUT SUBMITTALS

- A. Product List: For each product required.
 - 1. Indicate each product and cross-reference to finish system color including locations of application areas. Use same designations indicated on Drawings and in schedules. Provide Final Product List and include Finish System Chart in closeout documents.

1.5 MAINTENANCE MATERIALS

- A. Supply extra materials from the same product run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint, high-performance coatings, stains and transparent finishes: 1 gal. of each material, color and finish applied.

1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in paints and coatings on commercial projects with minimum five years of continuous, uninterrupted experience in successfully performing work similar in material, design, and extent to that indicated for this Project, with a record of successful in-service performance, and who employs skilled tradesmen with minimum three years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers with original labels in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F nor greater than 90 deg F

and/or more restrictive requirements as per manufacturer.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints, high performance coatings, stains and transparent finishes only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F and/or more restrictive requirements as per manufacturer.
- B. Do not apply paints, high-performance coatings, stains and transparent finishes when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp, wet and/or unprepared surfaces. Coordinate any more restrictive requirements with manufacturer.
- C. Only apply paints when atmosphere is relatively free of airborne dust and contaminants.
- D. When dry abrasive blasting carbon steel surfaces, the dew point temperature in the space must be maintained at least 17 deg F. lower than the temperature of the surface being prepared or greater as per manufacturers' recommendations.
- E. During paint and coating application, the dew point temperature in the space must be maintained at least 10 deg F. lower than the temperature of the surface being painted along with additional more stringent parameters set forth by paint and coating manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The "Basis of Design" shall be products of Sherwin-Williams as listed in Article 3.6, Painting Schedule. These product listings establish performance requirements and a standard of quality, unless otherwise specified.
 1. Substitutions: No substitutions permitted.

2.2 PAINT, GENERAL

- A. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
 3. Provide products of same manufacturer from each coat in a finishing system and prepare paints per manufacturer's recommendations.
- B. VOC Content: Products shall comply with VOC limits of Authorities Having Jurisdiction [<>].
 1. Flat Paints and Coatings: 50 g/L
 2. Nonflat Paints and Coatings: 150 g/L.
 3. Primers, Sealers, and Undercoaters: 200 g/L.
 4. Floor Coatings: 100 g/L
- C. Colors: Specified in Finishes List on Drawings.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows (or less as per manufacturer):
 1. Concrete: 12 percent

2. Wood: 15 percent
 3. Gypsum Board: 12 percent
- C. Interior and Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Verify gypsum board finish level before application of paints and high-performance coatings.
1. Gloss, semi-gloss and high-performance coatings – Level 5 Drywall Finish.
 2. Satin, eggshell and flat paints – Level 4 Drywall Finish.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer recommendations and recommendations in "MPI Manual" applicable to substrates and finish systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be finished. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing finish operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, high-performance coatings, stains and transparent finishes including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce finish systems indicated.
- D. Concrete Substrates: Allow concrete to cure for 28 days. Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer recommendations.
1. Concrete Floors: Prepare concrete floors by abrasive blast cleaning and/or mechanically profiling in accordance with manufacturer's recommendations. Acid etching may be used if specifically recommended by manufacturer.
 2. High Performance Coatings:
 - a. Clean surfaces with pressurized water. Use pressure range in accordance with MPI Manual.
 - b. Abrasive blast clean surfaces to comply with SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning."
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- F. Wood Substrates:
1. Wood substrates to be finished with paint or high-performance coatings.
 - a. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for use in paint system indicated.
 - b. Sand surfaces that will be exposed to view, and dust off.
 - c. Prime edges, ends, faces, undersides, and backsides of wood.
 - d. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- G. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.
- H. Mold or Mildew: Notify Owner and Architect of all locations where mold or mildew is discovered before proceeding with application of any finish systems. Removal of substrate material will be required at all gypsum product locations and at other areas as directed by Owner.

3.3 APPLICATION

- A. Apply paints, high-performance coatings, stains and transparent finishes according to manufacturer recommendations and recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for finish system and substrate indicated.
 - 2. Finish surfaces behind movable items same as similar exposed surfaces. Before final installation, finish surfaces behind permanently fixed items with prime coat only.
 - 3. Finish both sides and edges of hollow metal doors and entire exposed surface of hollow metal door frames.
 - 4. Finish front and back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 5. Prime glazing stops and glazing beads before glass is installed.
 - 6. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 7. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply finishes to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Apply minimum four coats of paint or high-performance coating to surfaces specified to receive deep or bright colors.
- F. Remove grilles, covers, and access panels and paint separately.
 - 1. Keep all sprinkler heads and escutcheons free of paint.
 - 2. Backprime and paint face and edges of fire-retardant plywood service panels for telephone and electrical equipment before installation, to match adjacent wall surface. Leave equipment in original finish except for touch up as required, and paint conduits, mounting accessories and other unfinished items.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered finishes by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted or finished surfaces.

3.5 PAINTING SCHEDULE

INTERIOR PAINTING SCHEDULE

IPS-4GYPSUM WALLBOARD/PLASTER SUBSTRATES – CEILINGS [<>]

ACRYLIC LATEX

FINISH: FLAT

- A. 1st Coat: ProMar 200 Interior Zero VOC Latex Primer #B28W02600
- B. 2nd & 3rd Coats: ProMar 200 Zero VOC Interior Latex Flat #B30W2600 Series

IPS-5 GYPSUM WALLBOARD/PLASTER SUBSTRATES – WALLS

ACRYLIC LATEX

FINISH: EGGSHELL

- A. 1st Coat: ProMar 200 Interior Zero VOC Latex Primer #B28W02600
- B. 2nd & 3rd Coats: ProMar 200 Zero VOC Interior Latex Eg-Shel #B20W2600 Series

IPS-6 GYPSUM WALLBOARD/PLASTER SUBSTRATES

WATERBASED, CATALYZED, EPOXY RESIN HIGH-PERFORMANCE COATING

FINISH: SEMI-GLOSS

- A. 1st Coat: ProMar 200 Interior Zero VOC Latex Primer #B28W02600
- B. 2nd & 3rd Coats: Waterbased Catalyzed Epoxy #B70 Series

OR FOR THE INTERIOR SIDE OF AN EXTERIOR WALL

Microbicial Latex Finish System: With topcoat EPA registered No. 64695-1.

- C. 1st Coat: Primer, latex, interior: ProMar 200 Zero VOC Latex Primer, B28W2600
- D. 2nd Coat: Microbicial Latex, interior, first coat.
- E. 3rd : Microbicial Latex, interior, eggshell: Paint Shield Interior Latex Eg-Shel Microbicial Paint, D12W51, at 4.0 mils wet, 1.8 mils dry, per coat. Brush and roll application only.

Finish: Eggshell

IPS-7 WOOD SURFACES TO BE PAINTED

LATEX ENAMEL

FINISH: SEMI-GLOSS

- A. 1st Coat: Premium Wall & Wood Primer #B28W8111
- B. 2nd & 3rd Coats: Pro Industrial Zero VOC Acrylic Semi-Gloss #B66-650 Series

IPS-9 CONCRETE FLOORS

POLYAMIDE EPOXY COATING

FINISH: GLOSS

- A. Primer: Armorseal Floor-Plex 7100 Primer Water Based Epoxy Floor Coating #B70 Series
- B. 2nd & 3rd Coats: Armorseal Floor-Plex 7100 Water Based Epoxy Floor Coating #B70 Series (See Interior Design Finish Listing in the Drawings.)
- C. 2nd & 3rd Coats: Armorseal Floor-Plex 7100 Water Based Epoxy Floor Coating #B70 Series with SharkGrip Additive (See Interior Design Finish Listing in the Drawings.)

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END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. The scope of work addressed in this section includes the following signage types:
 - 1. Exterior Signage
 - a. Wall mounted Internally Illuminated letterforms
 - 2. Interior Static Signage (list of sign classifications not individual sign types)
 - a. Directional Signs
 - b. Room Identification Signs
 - c. Informational Signs
 - d. Regulatory Signs
- B. Provide "Sign" types of the sizes, materials, images and arrangements consisting of special and standard components and construction as shown on the Design Intent Drawings and specified in this Section. Signs shown on these drawings depict general sign configurations, typography, graphic layouts, and sign placement. This section includes the following types of signs, graphics, and other identifying devices:
 - 1. Interior building signs and sign supports.
 - 2. Exterior vehicular directional signs
- C. These 10 1400 specifications provide detailed information regarding products, processes and other information that supplements the information included on the Design Intent Drawings for each sign type. In the event of conflict, refer to the information provided on the design drawings. All signage provided shall be of the design, detail, sizes, types, and message content shown on the design drawings and shall conform to the requirements specified. Signs shall be provided and installed as specified complete with lettering, framing as detailed and all related components for a complete installation.
- D. Detailed message content for each sign location is indicated on the sign message schedule included in the sign detail drawing. Sign message content for each exterior sign is indicated on the Design Intent Drawings and exterior sign location plan. All sign message content may require modifications as a result of changes during the construction process or at the Owner's direction. The Contractor shall verify the accuracy of all sign messages with the Architect/Engineer prior to fabrication. Notify the Architect/Engineer regarding any discrepancies between the message information indicated on the messages schedule and the documentation provided on the design or sign location drawings.
- E. Ownership and Copyrights: All designs, drawings, graphics, specifications and artwork provided in the contract documents are for the sole use of the **HCA/ Lake City Medical Center** projects only. The Owner shall own the exclusive rights to all designs, drawings, logos, artwork, digital files or other documents created in association with work for all projects. All rights of ownership, use and reproduction of these digital files are at the sole discretion of the Owner and the Architect/Engineer. Any reuse of these items without the expressed written consent of the Owner and Architect/Engineer is prohibited.
- F. Use of Electronic Files: The electronic files created by the Architect/Engineer that comprise the design intent drawings included in this package will be provided to the selected Contractor to facilitate the production of shop drawings and fabrication.
 - 1. Design intent drawings created by the Architect/Engineer shall not be considered shop drawings and shall not be submitted as such. The usage of any parts of these drawings are at the sole discretion of the Architect/Engineer.
 - 2. The electronic files created by the Architect/Engineer will be provided to the Contractor after the Contractor has received a contract and notice to proceed. These electronic files will only be provided

- after the Contractor has submitted and received a fully executed and signed Digital Data Licensing Agreement (AIA Document C106).
3. The electronic files created by the Architect/Engineer will be provided to the Contractor in the file format of the software used to create them. Any translation required will be the responsibility of the Contractor. These electronic files constitute the extent of the production artwork to be provided by the Architect/Engineer and all additional work required shall be provided by the Contractor.
 4. The Architect/Engineer assumes no liability for the accuracy of the digital files provided and the re-use of these files is at the Contractor's discretion. The Contractor is responsible for the verification of all information provided in these file for their use and convenience.
 5. The use of any portions of the design intent drawings by the Contractor is for this project only.
- G. Fonts and Typestyles: The fonts and typestyles listed on the general information sheets of the design intent drawings are to be utilized as indicated on the appropriate sign types. If the Contractor does not already own these fonts, they shall be purchased by the Contractor at his expense as required. The cost of all required project fonts and typestyles shall be included in each contractor's bid. The Architect/Engineer is not legally allowed to provide the Contractor with any fonts or typestyles.
- H. Related Work: Work as employed herein, includes any material, equipment, construction, labor, installation, service or maintenance and warranties required to complete the fabrication and installation prescribed in these contract documents. This shall include, but not limited to, all of the sign types listed in the sign message schedule and drawings.

1.2 RELATED DOCUMENTS AND SECTIONS

- A. The purpose of all "Related Documents" (also referred to as Contract Documents) is to serve as a reference which identifies materials, construction specifications, and quality controls, as well as signage fabricator/contractor's responsibilities and obligations. The Contractor(s) shall furnish and install signs and/or graphics as detailed on drawings and/or described in these specifications. Signs shall carry messages and images as specified in the attached Sign Message Schedule.
- B. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. "Related Documents" refers to the drawings, specifications, sign message schedule, including all addendum and modifications incorporated therein before their execution. When applicable, additional appendages provided by Owner, Owner's Representative, Architect/Engineer or General Contractor shall also become part of the contract documents.
1. Interior Sign Design Intent Drawings and Location Plans (30" x 42") Sheets, AG201A, AG201B, AG201C, AG801, AG802..
- C. Related Sections:
1. Division 00 – Procurement Requirements
 2. Division 01 – General Requirements
 3. Division 02 – Existing Conditions
- D. Addenda: Covering changes, corrections, and special interpretations of the drawings and specifications, shall become a part of the Contract Documents.

1.3 DEFINITIONS

- A. The Owner: HCA/ Lake City Medical Center, Lake City FL
- B. Project: ER Expansion/Dining Renovation/Pharmacy Renovation/Ancillary Building

- C. Contractor: The term indicates the company, firm or business entity that has a contract with the Owner to provide signs and other services specified in this section. Since there are typically multiple contractors involved with the execution of the work required in these specifications and contractor documents, the term "Contractor" is used consistently throughout these specifications to refer to any contractor involved in this work. These specifications do not attempt to indicate which contractor (general, signage, electrical or other types of sub-contractors that may be involved in the project) is responsible for various tasks. The Contractor that is contracted by the owner for this work shall assume sole source responsibility for the successful execution of all work specified in these contract documents by all other contractors unless otherwise specified.
- D. Installer: The qualified contractor used to install signs, structures and support systems.
- E. Project Team (PT): The Project Team refers to all stakeholders involved with a specific project. PT members may include the Owner, Architect, Engineer, Graphic Designer, Construction Manager, Consultants or others involved with the project design and construction.
- F. Architect/Engineer: Since Gresham Smith is a multi-discipline firm that provides architectural, engineering, graphic and interior design and many other design services. The term Architect/Engineer is consistently used in these specifications to refer to Gresham Smith as an organization. Specific references to the Architect or Engineer may refer to other firms involved in the project that may or may not be contracted by Gresham Smith. Designer: The term "Designer" is used for Graphics prime projects and refers to the Gresham Smith Experiential Graphic Design and Wayfinding Group.
- G. Architect: This term is typically used in these specifications to refer to the Architect of record for this project that may or may not be Gresham Smith. It may also include other architects involved in the projects that may be required to review submittals and provide supplemental information as needed. Request clarification from the PT if there are questions regarding the use of this term in specific sections.
- H. Engineer and Signage Engineer (SE): This term "Engineer" is used in these specifications to refer to multiple engineers involved in this project depending on the section and topic where it may be used. Examples include references to the building or roadway structural engineers, electrical engineers, special systems or telecom engineers, etc. Since these specifications require all signage structures and attachments to be provided by the Contractor on shop drawings and other submittals, the term Signage Engineer is used to clarify the responsibilities of this term, Request clarification from the PT if there are questions regarding the use of this term in specific sections.
- I. Construction Manager (CM): A Construction Manager may be selected to administer the overall project and all other Contractors may be contracted by the CM or they may be contracted separately by the owner to facilitate contraction activities.
- J. Contract Documents (CD): The Contract Documents include all design intent drawings, location plans, message schedules, specifications and all other information provided to the Contractor in association with this project.
- K. Document Controls Manager (DCM): A DCM may be utilized by the Owner or CM to track and manage all documents issued and received for the project. The Contractor is required to comply with the document controls procedures established for this project for all communications and submittals, unless otherwise specified. Unofficial submittals not process through the established protocols will not be reviewed or acknowledged.

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Final Design Liability: The Contractor shall assume the sole responsibility for the final design liability, engineering and construction of all signs and other finished products. The Contractor shall also be responsible

for engineering all foundations or anchorages and shall submit shop drawings with appropriate engineer's seals including calculations indicating all applicable fabrication and installation details for review and approval of the Owner and Architect/Engineer. The final size of structural members and required metal thicknesses are the responsibility of the Contractor to ensure compliance with all engineering design loads and constructability requirements.

- B. Design Intent Drawings: The drawings provided in the contract documents bid package are for design intent only. All signage and other products provided shall be of the design, detail, sizes, types, materials and message content shown on the design intent drawings and described in these specifications shall conform to the requirements specified.
1. These design intent drawings shall **not** be considered as shop drawings and shall **not** be re-submitted to the Architect/Engineer as such.
 2. The re-use of any portions of the design intent drawings provided to the Contractor is at the sole discretion of the Architect/Engineer.
 3. The Architect/Engineer shall retain the copyrights to all designs included in these drawing and the use of any portions of these drawings for any other project is forbidden without the express written consent of the Architect/Engineer.
 4. Connections, angles, shapes, and details shown are a graphic indication of requirements and may not necessarily be the correct size or indicate best method of attachment or support.
 5. Details, anchors, and devices, not shown, are to be submitted to Architect/Engineer for review prior to fabrication.
- C. Specifications: The product and performance requirements in these specifications and related referenced sections provide detailed information regarding products, processes and other information that supplements the information included on the design intent drawings. The Contractor shall be responsible for the performance of the completed work and ensure that all signs function according the project requirements. In the event of conflict, refer to the information provided on the design intent drawings.
- D. Signage Message Schedules and Location Plans: Signage message schedules and location plans have been provided by the Architect/Designer as part of the bid documents to help determine quantities and provide logistical information for the Contractor during the bid process. Modifications and revisions to these messages and/or locations should be expected as construction progresses, and new information is discovered.
1. Required modification to sign location and individual messages will be provided to the Contractor through Bulletins or other supplemental documentation as required.
 2. The Contractor shall notify the Architect/Engineer immediately upon receipt of each Bulletin if there are potential cost or scheduling impacts that may require Owner approval.
 3. The Contractor shall verify the accuracy of all sign message schedules and location plans with the PT prior to fabrication.
 4. All final message content and location specific installation details shall be included on the final shop drawings submitted for use in fabrication.
 5. Notify the Architect/Engineer as necessary regarding any discrepancies between the information indicated on the messages schedules and the documentation provided on the design or sign location drawings.
- E. Stamped Engineering Drawings and Calculations: The Contractor shall provide signed and sealed drawings and calculations by a qualified, professional Engineer licensed in the state that the project is located. This required engineering information shall be provided on final shop drawings and shall include structural analysis calculations for all signs and structures required to comply with design loads. Structural analysis calculations shall be included on the shop drawings or submitted as supplement information along with the shop drawings.

- F. Structural Requirements and Design Loads: All signs and support structures shall be engineered by the Contractor or their Engineer sub-contracted by them for this project to resist wind loads required by local

jurisdiction or more according to special situation requirements. Design load requirements shall also include thermal movement resulting from 140-degrees F temperature change, without distortions, excessive deflections or failure of supports to backup construction. The Contractor is responsible for the structural integrity of all sign components, structures and foundations required.

- G. Structural Supports and Foundations: All structural supports and foundations for the signs, reinforcements and any other services needed for the completion of all required signage shall be provided by the Contractor unless otherwise noted in the contract drawings as "to be provided by others."
- H. Weight Limitations: It is the Contractor's responsibility to ensure that all signs provided comply with the maximum weight limitation for each sign location. Refer to the structural drawings and specifications and coordinate with the PT to ensure all final designs comply with all weight limitations.
- I. Permits and Certifications: The Contractor shall be responsible for obtaining, at his expense, all permits, certifications, UL listings and all other such costs required for the execution of this work. The cost of all applicable permits and certifications shall be itemized and included as part of each bid submission.
- J. Union Labor: If the use of union labor is a requirement for all activities on the job site, the Contractor shall be required to comply with all requirements regarding the approved use of union labor for the installation of signs and all other union labor regulations and criteria.
- K. Work Plans: The Contractor is responsible for coordinating with the Owner and all other contractors regarding detailed work plans and prior approvals. These may include, but are not limited to the following:
 - 1. Work plans for occupied spaces during regular business hours.
 - 2. Work plans for off-hours work at night.
- L. Temporary Signage: The Contractor shall install temporary signage to replace all existing signs when they must be removed to allow for renovation work in active public areas.
 - 1. Temporary signs shall only be removed when they are replaced with the permanent signs at the same time.
- M. Removal of Existing Signs: The Contractor shall remove and dispose of all existing signs at their expense as needed to facilitate the renovation work. All existing sign materials shall be recycled as much as possible or otherwise disposed of in an environmentally responsible manner as required by code requirement of authorities having jurisdiction.
 - 1. Replace existing signs remove immediate with temporary or new permanent signs as required.
 - 2. Temporary signs shall be provided in all active public areas as needed.
 - 3. Patch and replace any damaged surfaces from removed signs.

1.5 REGULATORY AND CODE REQUIREMENTS

- A. Code Compliance Responsibility: The Contractor is fully responsible for compliance with applicable requirements of the laws, codes, ordinances and regulations of federal, state and municipal authorities having jurisdiction in order to protect the Owner from liability. The Contractor shall endorse the design direction and work toward a goal to exceed code requirements where practicality and aesthetics allow. Request clarification from the Architect/Engineer regarding any questions regarding the code requirements for this project.
- B. Accessibility Guidelines (ADA-ABA): Signage and all other work for each project must comply with the U.S. Architectural & Transportation Barriers Compliance Board's Americans with Disabilities Act (ADA)

Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.

- C. National Fire Protection Agency (NFPA): Comply with current version of all NFPA requirements regarding signage. The requirements of NFPA are very specific regarding stairway identification, exit signage, electrical signs and other sign classifications. Information about the building, life safety plans, alarm systems, door hardware and other details must be clearly understood in order to provide the correct signs and message content in the appropriate locations. Request clarification from the Architect/Engineer as needed.
- D. City and County applicable Signage Codes or Requirements: Comply with all requirements of the local authorities having jurisdiction.
- E. Fire Marshal Approval: The Contractor is responsible to obtain approval from the local Fire Marshal having jurisdiction of all required signs, message content and exact location details prior to fabrication.
 - 1. Coordinate the exact location of each sign in the field, while walls and ceilings are still exposed to coordinate with fire sprinkler locations, security cameras, structural supports and electrical supplies.
 - 2. Obtain Fire Marshal approval of all sign locations before ceilings and walls are completed to avoid conflicts after the finished signs are installed.

1.6 QUALITY ASSURANCE

- A. Single Source Accountability: Provide all signs required for each project under a single contract. Signs and related materials shall be fabricated by a Contractor regularly engaged in the manufacturing of such products. Signage shall be obtained from a single manufacturer with specific components (such as custom aluminum extrusions or other raw materials) outsourced as needed to subcontractors and manufacturers of specialty products as specified. Submit product data sheets regarding any outsourced components utilized.
- B. Fabricator Qualifications: The Contractor shall be responsible for the quality of all materials and workmanship required for the execution of each contract including any firm or individual who may serve as the Contractor's sub-contractor. The Contractor is reminded that a high-quality level of professionalism, workmanship and materials is expected in all aspects of this project. The Contractor shall be responsible for providing all up-to-date drawings, schedules and any other required information to all sub-contractors and the PT. The manufacturer's logo or information may not be located on any sign surface visible to the public, except for the information required on the UL labels.
- C. Installer Qualifications: Engage an experienced installer who is an authorized representative of the Contractor and has completed installations of signs similar in material, design, and extent to those indicated for the project. Provide references as requested regarding previous project experience and their record of successful in-service performance.
- D. Experience and References: The signage contractor and installer must have experience in the fabrication and implementation of signage programs for multiple airport projects of comparable size and complexity to the current project.
- E. Graphic Content and Style: Provide sign message content to comply with requirements indicated for sizes, styles, spacing, content, positions, materials, finishes and colors of letters, numbers, symbols and other graphic devices. Verify sign and copy length for proper fit. Notify the Architect/Engineer in writing of discrepancies prior to fabrication.
- F. Correction of Defective Work: Work determined to be defective by the Architect/Engineer, the Owner, the Owner's representatives, inspection agency or authorities having jurisdiction, regardless of all previous inspections, shall be corrected to the satisfaction of the entities involved at no extra cost to the Owner.

1.7 ACTION SUBMITTALS

- A. Initial Submittals: Within 10 business days from the issuance of contract award the Contractor shall supply the following for approval:
1. A Submittal Schedule indicating the timetable for all required submittals, including milestone dates for submittal reviews and approvals.
 2. A Gantt chart showing the timetable for the work outlining the time periods required for the execution of each phase of the work. The tasks and milestones to be addressed shall include, but are not limited to, the following:
 - a. Time periods required to provide product data submittals.
 - b. Time periods required to provide to produce shop drawings.
 - c. Time periods required to secure permits.
 - d. Lead times for specialty items and outsources materials
 - e. Time periods required manufacturing, shipping and installation itemized separately.
 - f. Any other specific details requested by the Owner and Architect/Engineer.
 3. As the construction schedule advances, revise and resubmit the chart to show rescheduled work and milestones achieved.
- B. Preliminary Submittals: Within 30 days of issuance of contract award, and before beginning work, the Contractor shall supply the following for approval:
1. A complete list of products to be supplied accompanied by manufacturers' data sheets and samples for each product.
 2. Actual samples of all proposed materials and colors, labeled with corresponding project identification codes.
 3. Preliminary shop drawings detailing all proposed materials, finishes, and colors for all exposed surfaces and custom items for approval.
- C. Product Data Submittals: Provide manufacturer's product details relative to materials, dimensions of individual components, profiles and finishes.
1. Include manufacturer's data substantiating that materials comply with requirements indicated and document the product life expectancy of a minimum five years in continuous field use.
 2. Provide documentation for any products like monitors, lighting elements, electronic or electrical items that may have a manufacturer's warranty of less than five years.
 3. No substitutions of any materials or finish system will be allowed without prior written approval by the Architect/Engineer.
 4. Include manufacturer's cleaning and maintenance procedures documentation.
- D. Samples for Initial Selection: If and as requested by the Architect/Engineer, provide manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
1. Paint.
 2. Aluminum (finishes).
 3. Acrylic sheet (opaque and translucent).
 4. Vinyl (opaque, translucent, reflective, etc.)
 5. Other products or materials as requested.
- E. Substitutions: Substitutions shall be limited to those items that contain in their description the qualifying phrase "or approved equal".

1. Substitutions for materials and/or methods of construction/fabrication that have been specified herein and in the design intent drawings must be accompanied by the following documentation:

- a. Product data including drawings, specifications, fabrication and installation procedures.
 - b. Samples of the new product in a similar configuration and/or with similar finishes.
 - c. A written comparison of the important qualities of the two products such as size, weight, durability, and visual appearance.
 - d. A written list of any changes that would be required to other components due to the substitution.
 - e. A statement indicating the substitutions effect on schedule.
 - f. A cost comparison between the two products.
 - g. Certification by the contractor that the proposed substitution is equal to or better in every respect to the product specified in the contract documents.
 2. The Contractor's request for a substitution will be considered by the Architect/Engineer when the following conditions are satisfied:
 - a. Extensive revisions to the contract drawings are not required.
 - b. Proposed changes are in keeping with the design intent of the contract drawings.
 - c. The request is timely.
 - d. The material or product specified in the contract drawings cannot be obtained within the contract time or the material does not conform to necessary regulations, codes, or requirements.
 - e. The specified material cannot provide a warranty required by the contract documents.
- F. Preliminary Shop Drawings: After receiving approval of product data sheets for products and materials to be utilized, submit preliminary shop drawings for fabrication and installation of all required sign prototypes **prior to the initiation of production for prototypes and all other manufacturing.**
1. Include details of all proposed materials, finishes, and colors for all exposed surfaces and custom items for approval
 2. Include all applicable fabrication and installation details for all prototype signs.
- G. Engineering: All signs, foundations and connections shall be engineered by the Sign Engineer employed by or sub-contracted to the Contractor. All signs and structures shall be engineered to resist wind loads and thermal movement resulting from severe temperature changes consistent with the local climate requirements without distortions, or excessive deflections, or failure of supports to backup construction. Fabrication details and shop drawings shall be provided by the Contractor and shall include design calculations and the signed seal of a registered structural engineer licensed in the state that the project is located, to ensure compliance with all design and load requirements. These shop drawings shall illustrate all means of mounting and attachment in elevation, plan and side views, and sections for proper coordination for connections with building structures.
1. Internal Structural Framing: The internal structural framing system required shall be designed and engineered by the Contractor to withstand all design loads and maximum weight limitations.
- H. Final Shop Drawings: After the approval of all product data submittals and prototypes required, submit final shop drawings for fabrication and installation of all signs. By the approval and submission of shop drawings and samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so, and that he has checked and coordinated each shop drawing and sample with the requirements of the work and the contract documents. Include all comments made by the PT during prototype and/or mockup reviews and approvals. Provide detailing of all proposed materials, finishes, fabrication methods and colors for all exposed surfaces and custom items. Include all applicable fabrication and installation details for all signs.
1. Do **not** proceed with the fabrication of any final products until final shop drawings have been

- submitted and approved by the Architect/Engineer.
2. The electronic files of the design intent drawings created by the Architect/Engineer are **not** to be considered shop drawings and shall not be re-submitted as such back to the Architect/Engineer. The

- electronic files provided are intended to facilitate the shop drawing process by providing a base line on information such as elevations, building sections and other useful information that may help the Contractor create complete drawings with accurate information.
3. Shop drawings submitted by the Contractor shall **not** contain any notes or language claiming that the Contractor owns the copyrights for the designs created by the Architect/Engineer and provided to the contractor for their use on this project.
 4. Provide only field verified dimensions and other details. No "field verify" or "to be determined" notes will be accepted. Any shop drawings submitted that do not include required information will be rejected and not reviewed.
 5. Shop drawings shall clearly illustrate typical sign message layouts, means of mounting and attachments. At a minimum, shop drawings must show as much or more detail than provided in the design intent drawings. Any drawings submitted that do not include important information provided on the design intent drawings will be rejected and not reviewed.
 6. Document all materials, including part numbers, product numbers and color references.
 7. The exact identification of all paints and coatings shall be noted for each material of component.
 8. All shop drawings must be to scale with the correct scale identified.
 9. Submission of electronic files for shop drawings is required.
 10. Include plans, elevations, fabrication details, typical message layouts and dimensions referenced to permanent project features.
 11. Include details of all electrical and communications connections.
 12. Show mounting details, locations of supplementary supports to be provided by others, and accessories. Show anchorage types, locations and accessory items.
 13. Indicate gravity loads on supports for all signs that have mechanical attachment.
 14. Stamped engineering drawings and structural analysis calculations as required shall be included on the shop drawings or submitted as supplement information.
 15. Include wiring diagrams indicating power, signal and control wiring as appropriate. The design intent of the wiring is to inter-connect the equipment to utilize its capabilities to the fullest extent.
 16. All shop drawings, schematic diagrams, and connection diagrams must be approved by the Architect/Engineer prior to beginning work.
 17. Indicate acknowledgement of all addenda issued by the Architect/Engineer on the final shop drawings to ensure the most current information is reflected in the drawings approved for fabrication.
 18. Include wiring diagrams for all electronic and electrical systems that show all required details regarding power, signal and controls.
- I. Message Content Layout Drawings: In addition to shop drawings that provide sign fabrication details, the Contractor shall furnish scaled face layout drawings for each sign type and unique copy layouts as appropriate. Message content face layout drawings shall show type style, type size, type alignment and spacing, spelling, punctuation, word placement on sign face referenced to outline of sign face, line spacing, logos and other composition requirements. All required dimensions shall be provided and accurately detailed.
- J. Submittal Format: All shop drawings must be produced at an appropriate scale and submitted in electronic format with a sheet size no smaller than A1.
- K. Samples for Verification: Submit a minimum of four (4) complete sets of all required samples for approval. One set each will be retained by the Architect/Engineer, the Owner, GC or CM and one reviewed set will be returned to the contractor for their records and use. Samples retained by the PT members will be used to compare the finished work provided with the approved samples. Any finished products that do not match the approved samples will be rejected and replacement products will be required.

1. Provide four (4) 4" x 4" samples for each material (include all required color variations) and specialty products specified.

2. Provide four (4) 4" x 4" samples for each paint specified. Include separate samples for each material to be painted, since they may require separate paints for aluminum, plastic, steel, zinc, concrete, etc. Note: Painted material samples to be as thin as possible while providing stability.
 3. Provide four (4) 4" x 4" samples of required finishes, surface textures and other qualities of each material specified.
 4. Provide four (4) 4" x 4" samples of each printed color specified on the exact substrate specified.
 5. Provide four (4) 4" long samples each for all aluminum extrusions specified.
 6. Provide four (4) 1'-0" samples each for the LED lighting extrusions assembly (complete with LEDs)
 7. Provide four (4) 1'-0" x 1'-0" samples for all printed sign face panels.
 8. Include a printed label on each sample indicating the sign fabricator name and contact information, project name, material manufacturer's product number, product designation in signage drawings, and other details to clearly identify the nature and use of each sample. All paint samples shall be identified with Pantone Matching System (PMS) number or equivalent.
- L. Prototypes: Provide full-size, fully functional prototypes of the sign types listed below. Working prototypes shall be installed on-site in an area designated by the Owner and shall be operational 24 hours a day for a period of two weeks (minimum). Approved prototypes in a condition suitable to the Owner may be incorporated into the final quantities required unless otherwise specified. Obtain Architect/Engineer approval before fabricating signs for the Work. The required prototypes for the project include the following sign types:
1. Interior sign types C1,C2,C3
 2. Make any requested corrections or changes in submittals, mock-ups and prototypes at no additional cost to the Owner.
 3. Resubmit for review until no exceptions are taken.
 4. Indicate any changes that have been made other than those requested.
- M. Artwork Creation: Any required artwork that is not clearly noted on the design intent drawings to be provided by the Architect/Engineer, shall be provided by the Contractor. This includes any modifications required in digital map artwork files for orientation, information or egress maps that may be provided by the Architect/Engineer. These Contractor required modifications may include changes in orientation, scale, egress routes, you are here indicators and other similar location specified changed required.
1. The Contractor shall submit the all proposed original or modified artwork required to the Architect/Engineer for review and approval.
 2. All map artwork shall be customized for each separate sign location so that it is correctly oriented for the user when it is installed.
 3. The Contractor shall verify any questions regarding artwork creation or modification requirements prior to submitting a bid.
 4. When required, all map artwork development costs shall be itemized separately and included as part of the overall bid submission.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. General: Provide materials selected for exceptional high qualities of surface flatness, smoothness and freedom from surface blemishes wherever exposed to view in the finished units. Use only materials which are new, free of defects impairing strength and durability, and exposed materials which are free of surface blemishes, including pitting, roughness, seam marks, roller marks, trade names, stains, discolorations,

scratches and similar damage which is visible in the complete work. Unless the surfaces are to be painted, do not use materials that have stains and discolorations. For exposed items of work that include plain flat surfaces in width of more than 50 times the metal thickness, provide sheet stock from the mill that has been

stretcher leveled to the highest standard of flatness commercially available. All installation hardware shall be stainless steel or approved equal.

1. Flatness of Panels: Panels shall show no visual distortion when viewed in installed position. All panel faces shall be of such flatness that when measured, the maximum slope of the surface at point, measured from the nominal plane of the surface, shall not exceed 1.0%. Any panel not meeting these requirements is subject to rejection by the Architect/Engineer.
- B. Acrylic: Provide clear cast (not extruded or continuous cast) methacrylate plastic sheet with a minimum flexural strength of 16,000 psi, ASTM D 790, minimum allowable continuous service temperature of 180-degrees F (82-degrees C); in sizes and thicknesses indicated on the drawings.
1. Acceptable manufacturers include the following:
 - a. Plexiglas, subsidiary of Arkema.
 - b. Acrylite GP by Cyro Industries.
 - c. "Lucite L" by General Electric.
 - d. Approved equal.
- C. Acrylic for Digital Printing: Utilize white non-glare "digital acrylic" specifically designed for direct digital printing to provide optimal adhesion of UV curing inks without adhesion promoters. Physical properties to include a total light transmittance of 92% with no more than 2% haze in accordance with ASTM D-1003. Thickness to be 1/8" unless otherwise specified. Print only on the side designated by the manufacturer to receive direct digital printing.
1. Acceptable manufacturers include the following:
 - a. Optix-DA #7328 as manufactured by Plaskolite, Inc.
 - b. Approved equal.
- D. Acrylic Sheet Colored Coatings: Provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for 5 years for application intended.
- E. Acrylic (Thermoformed): Provide .125" thick clear, non-glare acrylic monolithic thermally formed and bonded sign faces for all interior room identification signs that require tactile characters and Grade 2 Braille. These signs shall be fabricated utilizing a high-pressure thermoforming process that provides a fully homogenous plaque sign. The sign body, face, raised text and Braille shall be compression molded to form a single dimensional component with enough toughness to resist scratching, cracking, gouging and graffiti. Background colors and patterns shall be printed and/or painted on the 2nd surface with the colors specified on the drawings.
1. Tactile characters shall be painted on the 1st surface with a contrasting color from the background as specified on the drawings.
 2. The Grade 2 Braille shall clear, domed and spaced per ADA requirements and shall show same color as the background on the second surface.
 3. Comply with all ADA requirements for tactile and Braille signs.
- F. Aluminum Extrusions: Provide aluminum extrusions of alloy and temper with adequate structural characteristics and suitable for finishing as recommended by the aluminum producer or finisher for the type of use and finish indicated. Minimum strength and durability properties shall be as specified in ASTM B 221 for 6063-T5. Utilize shapes and thicknesses as shown in the drawings and as required to fulfill requirements, but not less than 1/8" (3.2 mm) thick unless otherwise shown.
1. Acceptable manufacturers include the following:

- a. SignComp
- b. Eastern Metal
- c. Signalex

- d. Approved equal.
- G. Epoxy: Two component thermosetting epoxy adhesive with 100% solids content, one of the following:
 - 1. Miracle Adhesives: No. NP-428.
 - 2. Hughson Chemicals: Chemlok #304.
- H. Film Tape Adhesive: 4-mil (0.1 mm) thick, double faced pressure sensitive film tape.
 - 1. Acceptable manufacturers include the following:
 - a. Minnesota Mining and Manufacturing (3M) Co.
 - b. Approved equal.
- I. Foam Tape: 4 mil (0.1 mm) thick, double-faced pressure sensitive film tape.
 - 1. Acceptable manufacturers include the following or approved equal:
 - a. Minnesota Mining and Manufacturing (3M) Co.
- J. Laser Engraving Material: Provide micro-surfaced impact-resistant acrylic equivalent to "Lasermark" as manufactured by Rowmark or approved equal in sizes shown. Provide thicknesses and colors as noted in the drawings. Exposed edges of this material to be painted where required for visual consistency with the adjacent background.
- K. Gatorboard: Flame retardant panel with the following minimum performance requirements.
 - 1. Standard Size: 48" x 96"
 - 2. Thickness: H" and I"
 - 3. Density: (H") 23-24 PCF and (I") 19-21 PCF
 - 4. Typical Physical Properties (Based on H" Thickness):
 - a. Internal Bond: 12-14 psi (typical value for the core)
 - b. Modulus or Elasticity: 280,000 psi approximately
 - c. Modulus of Rupture: 1,900 psi approximately
 - d. Compressive Strength: 60 psi at 10% deformation
 - e. Hardness Combustibility: Flamespread @ less than 25 (class A), Fuat Contributed @ 15, and Smoke Density @ less than 50
 - f. Machinability: May be used with most types of woodworking equipment. However, special care must be taken when sawing as chip-out may occur.
 - g. Thickness: # 1/16"
 - h. Squareness: # 3/16"
 - i. Straightness: Within J" when comparing the two diagonal measurements between opposite corners or the panel.
 - 5. Wrap: No manufacturing set. Wrap or curl greater than H".
- L. Glass: Utilize monolithic 3/8" thick clear tempered glass with beveled and polished edges. Text message content to be etched on the second surface and etched surface shall be factory-sealed with VisionGuard, a non-yellowing, non-deteriorating sealant as manufactured by Vision Products or approved equal.
- M. Light-Emitting Diodes (LEDs): Utilize white LEDs with a wavelength/color temperature of 6500 kelvin (K) unless otherwise specified. Each white LED module shall have a minimum light output of 24 lumens per module. Light output shall be a minimum of 190 lumens per square meter. Nominal light output shall be a

minimum of 115 lumens per square foot.

1. Acceptable manufacturers include the following:
 - a. General Electric

- b. AgiLight (A division of General LED, Inc.)
 - c. Cree
 - d. Approved equal.
- N. LED Lighting Engine: Utilize LEP on all interior surfaces of internally illuminated signs.
 - 1. Acceptable manufacturers include, but are not limited to the following:
 - a. Insight Lighting
 - b. LEDCONN
 - c. Lightology
 - d. Approved equal.
- O. LED Power Supplies: Utilize power supplies with constant current DC voltage output and a wide input AC voltage range 100-277 50/60Hz. Locate power supplies remotely where possible so that they are protected from the weather and easy to access for maintenance.
- P. Light Enhancement Paint (LEP): Utilize LEP on all interior surfaces of internally illuminated signs for optimum and even illumination.
 - 1. Acceptable manufacturers include the following:
 - a. Spraylat Corporation.
 - b. Approved equal.
- Q. Message Inserts: The Contractor shall provide all message inserts in signs that utilize them according to the final approved message schedule. These inserts shall be provided as part of the original installation. The Contractor shall also provide digital templates in Adobe Illustrator CS to the Owner to facilitate the in-house production of all message insert room identification and directional signs.
- R. Paint (Signage): Utilize acrylic polyurethane enamel paint on all applicable signage surfaces that has been manufactured specifically for signs and contains ultra violet inhibitors which are lightfast, weather, abrasion and wear resistant. Provide colors formulated to match the specific paint colors from various manufacturers and each Pantone Matching System (PMS) color as specified on the design drawings. Contractor shall apply paint system strictly observing manufacturer's recommendations regarding application and mixing. Apply as to achieve 100% coverage at a rate of 150 square feet per gallon or as manufacturer recommends. All paint finishes shall be satin or eggshell unless otherwise specified.
 - 1. Acceptable manufacturers include the following:
 - a. Matthews Paint
 - b. Akzo Wyandotte
 - c. Chemglaze, Hughson Chemical Division, Lord Corp.
 - d. Imron, DuPont de Nemours & Co.
 - e. PPG Pittsburg Paints
 - f. Ronan Paints
 - g. Approved equal.
- S. Paint (Concrete): Utilize exterior grade latex paint specifically formulated for application to outdoor concrete surfaces. Provide surface preparation and primer that is compatible with the finished paint provided. Apply primer and paint according to the manufacturer's written instructions. Unless otherwise noted, use the following products:
 - 1. Primer: Sherwin Williams Loxon Conditioner A24-100 Series.

2. Paint: Sherwin Williams "Resilience" Exterior Latex Flat K42 Series.
3. Approved equal.

- T. Phenolic Panels:
1. Thickness: 1/2 inch, UV resistant.
 2. Material: Exterior grade with 10 year warranty, based on ASTM 626/A; no changes after 1200 hours.
 3. Frost Resistance: No change after 15 cycles (16 hours ice at -20 degrees C and 8 hours thawing in air).
 4. Pollution Resistance: DIN 50018, no change after 20 cycles.
 5. Ease all exposed edges 1/4 inch radius.
 6. All exposed or projecting corners shall be 1/2 inch radius
- U. Photopolymer: Provide .250" thick exterior grade photopolymer for all stair identification sign panels that require tactile characters and Grade 2 Braille. Signs shall be painted on the 1st surface with acrylic polyurethane paint with the colors specified on the drawings.
1. Tactile characters shall be painted with a contrasting color from the background as specified on the drawings.
 2. The Grade 2 Braille shall be the same color as the background.
 3. Comply with all ADA requirements for tactile and Braille signs.
 4. Any signs located on the exterior of the building or otherwise exposed to the elements (such as in parking garages) shall utilize exterior grade photopolymer.
 5. Utilize NovAcryl photopolymer sheet as manufactured by Nova Polymers, P.O. Box 1035, West Caldwell, New Jersey 07007, (888) 484-6882; www.novapolymers.com or approved equal.
- V. Plastic Laminate: High-pressure plastic laminate, general purpose grade, smooth surface, 0.050-inch thick unless otherwise indicated. NEMA LD -3 horizontal grade, in colors and patterns shown, or as selected by the Architect.
1. Approved manufacturers include:
 - a. Nevamar: Exxon Chemical Company USA.
 - b. Wilson Art: Ralph Wilson Plastics Company.
 - c. Micarta: Westinghouse Electric Corporation.
 - d. Textolite: Parkwood Division of General Electric Company.
 - e. Formica: Division of Cyanamid Corporation.
- W. Polycarbonate Sheet: Provide polycarbonate sheet manufactured by extrusion process, coated on both surfaces with abrasion-resistant coating such as "Lexan" by General Electric or approved equal. Non-glare finish and UV protection with a 10 year warranty against yellowing, loss of light transmission and breakage. Colors to be white and yellow as required on the drawings. Thicknesses shall be as required to meet the design loads and required fabrication details:
1. Impact Resistance: 16 ft-lbf/in. (854 J/m) per ASTM D 256, Method A.
 2. Tensile Strength: 9000 lbf/sq. in. (62 MPa) per ASTM D 638.
 3. Flexural Modulus of Elasticity: 340,000 lbf/sq. in. (2345 MPa) per ASTM D 790.
 4. Heat Deflection: 265 deg F (129 deg C) at 264 lbf/sq. in. (1.82 MPa) per ASTM D 648.
 5. Abrasion Resistance: 1.5 percent maximum haze increase for 100 revolutions of a Taber abraser with a load of 500 g per ASTM D 1044.
- X. Printed Sign Message Panels: The printing of all sign message panels shall be provided by a professional printer utilizing a high-quality printer and inks capable of reproducing the specified colors of the project requirements. The printing products and process used must be calibrated as required and capable of consistently reproducing matching printed output, color density and accurate graphic quality. All printed

signage components must have an even visual appearance of all colors when both illuminated and not illuminated. No visible inconsistencies will be acceptable, and all sign panels shall include a protective overcoat that does not impact the color quality or appearance if required to deliver acceptable finished and

installed panels. Edge lighted sign message panels may require a double strike of printing ink in order to achieve the desired color saturation; provide as needed.

- Y. Graphic Films: Specific colors and types of graphic films used as the basis of design components for multiple sign types have been specified in the design drawings. All graphic films required shall be 3M brand as manufactured by the Minnesota Mining and Manufacturing Company (3M) or approved equal. Provide the exact colors and 3M product numbers provided on the drawings unless otherwise specified. All graphic films and sheeting shall be handled and applied in strict accordance with the manufacturer's product specifications and instructions.
- Z. Graphic Film (non-reflective): "Scotchcal" brand as manufactured by the Minnesota Mining and Manufacturing Company (3M) or approved equal. Provide the exact colors and 3M product numbers provided on the drawings unless otherwise specified.
1. Thickness shall be 0.003 inch minimum and 0.006 inch maximum, or as specified.
 2. The pigmented material shall be sufficiently opaque when applied to completely hide a contrasting black printed legend on a white surface.
 3. Properly processed and applied material shall withstand 5 years vertical, south facing, unprotected, exterior exposure at the work site with no appreciable deterioration such as cracking, checking, blistering, delamination, or loss of adhesion. The material will show no appreciable discoloration after cleaning.
 4. If material will come into contact with gasoline, provide "Scotchcal" brand Gasoline Resistant Clear Coat 3980. Apply to material according to manufacturer's directions to complete installation.
 5. Shrinkage shall not exceed 1/64 inch (0.4mm) in any direction.
 6. Screen inks shall be "Scotchcal" brand opaque screen printing inks Series 3900, or as approved.
 7. Press ink shall be "Scotchcal" brand letterpress inks Series 850, or as approved.
 8. For durability of screen and press inks on vinyl film in exterior application a clear coat shall be added. This clear coat shall be "Scotchcal" brand Clear Coat No. 3920 glass.
 9. Vinyl legends shall be steel rule or die-cut in such a manner that edges and corners are true, clear and photographically precise. Legends with rounded positive or negative corners, cut or ragged edges or edge build-up will not be accepted.
 10. Letterforms supplied that are specified to be installed by the Owner shall be pre-spaced on a carrier sheet with a cover sheet. The carrier sheet shall be capable of being removed intact by stripping without the use of water or other solvents at the time of use.
 11. Non-reflective vinyl film shall be "Scotchcal" brand as manufactured by the Minnesota Mining and Manufacturing Company (3M).
 - a. Thickness shall be 0.003 inch minimum and 0.006 inch maximum, or as specified.
 - b. The pigmented material shall be sufficiently opaque when applied to completely hide a contrasting black printed legend on a white surface.
 - c. Properly processed and applied material shall withstand 5 years vertical, south facing, unprotected, exterior exposure at the work site with no appreciable deterioration such as cracking, checking, blistering, delamination, or loss of adhesion. The material will show no appreciable discoloration after cleaning.
 - d. If material will come into contact with gasoline, provide "Scotchcal" brand Gasoline Resistant Clear Coat 3980. Apply to material according to manufacturer's directions to complete installation.
 12. Shrinkage shall not exceed 1/64 inch (0.4mm) in any direction.
 13. Screen inks shall be "Scotchcal" brand opaque screen printing inks Series 3900.
 14. Press ink shall be "Scotchcal" brand letterpress inks Series 850.

15. For durability of screen and press inks on vinyl film in exterior application a clear coat shall be added. This clear coat shall be "Scotchcal" brand Clear Coat No. 3920 glass or "Scotchcal" brand gasoline resistant clear coat No. 3980 where emblems or legend are subject to contact with gasoline.

16. Graphics shall be cut in such a manner that edges and corners are true, clear and photographically precise. Graphics with rounded positive or negative corners, cut or ragged edges or edge build-up will not be accepted.
- AA. Rigid PVC Board (Sintra): Provide thermoplastic (PVC) sheet shall be of thickness and sizes shown, formed to profiles and shapes indicated on the drawings. All exposed edges shall be filed smooth and finished with proper grit and painted to match the finish of the photopolymer and other materials on the same sign type. Where thermoplastic (PVC) sheet is to be bonded to itself or other substrates solvents or solvent-dispersed adhesives such as THF (Tetra Hydro Furan), Cyclohexanone, or MEK (Methyl Ethyl Ketone) based types shall be used. Prior to adhesive applications both surfaces to be joined must be clean, degreased and dry. The pretreatment procedure shall consist of wiping surfaces with isopropyl alcohol with non-colored cloth and allowing surfaces to properly dry. All surfaces shall be prepared to receive coatings or surface finishes according to manufacturer's latest for surface preparation and application but in no case less than one (1) applicable primer coat and two (2) final full coats. All finished surfaces shall be uniform.
- BB. Digital Output on Vinyl: Follow 3M Scotchprint product bulletin and instruction bulletins in their entirety. Provide vinyl in colors, textures and patterns selected by Designer from industry available colors. Markings must be manufactured using materials and procedures described in the appropriate product and instruction. Any technical questions relating to the 3M products referred to in the specification should be directed to 3M Commercial Graphics Technical Service at 800-328-3908. Surface preparation and application of markings must use the materials, methods and tools described in the appropriate Product and Instruction Bulletins.
- CC. Scotchprint Film Series 8620/8640:
1. Method of Decoration: 8620 base film with matte overlaminate 8911 or 8931 and 8700 toners.
 - a. Base Film: Marking Film #8620 White, Product Bulletin 8000/8600, Instruction Bulletin 4.7.
 - b. Application Tape: 3M Application Tape #SCPM-3, Instruction Bulletin 4.3.
 - c. Overlaminating Film: ScotchPrint Film #8911, Product Bulletin 8000, Instruction Bulletin 4.8;
 - d. ScotchPrint #8931, Product Bulletin 8000, Instruction Bulletin 4.8.
 - e. Related Literature: ScotchPrint Toners, Product Bulletin 8700; Surface Preparation (Non-Vehicular),
 - f. Instruction Bulletin 5.1; Application Procedures ControlTac Plus (Corrugated) Instruction Bulletin 5.4; and
 - g. ControlTac Plus (Flat and Curved), Instruction Bulletin 5.6; Removal Procedures, Instruction Bulletin 6.5
- DD. Screen Printing: All inks, paints and lacquers required for silk screened or imprinted surfaces or other specified surfaces, shall be a type made for the surface material on which it is to be applied and recommended by the manufacturer of the ink or paint. Exact identification of all ink and paint shall be noted on the shop drawings, together with data describing the method of application and if other than "air"-dried drying. All silk screen inks shall be made by a manufacturer with experience in production and consistency of such inks for the purposes and surfaces involved. All screen printing specified shall be executed from photo screens prepared from reproductions of the copy specified. The Contractor shall submit full-size showings of foundry to be used to the Architect/Engineer for approval. All above work is to be included in this contract. No hand-cut screens will be accepted. Prime coats or other surface pre-treatment, where recommended by the manufacturer for inks, paints or lacquers, shall be included in the work (and noted on the shop drawings) as part of the finished surface work at no additional cost to the Owner. All screen printing shall be executed in such a manner that all edges and corners of finished letterforms and graphic devices are true and clean. Letterforms with rounded positive or negative corners, edge build-up or bleeding, etc., will not be accepted. No paint, ink or lacquer that will fade, discolor or delaminate as a result of proximity to UV light source or heat there from shall be used. All

inks, paints and lacquers shall be evenly applied and without pinholes, scratches, orange peeling, application marks, etc. Rear-illuminated panels containing the above or other defects which cause light leaks in surface areas specified to be covered will not be accepted. Workmanship in connection

with finishes and formations of letters and/or graphics shall conform to the standards of the trade and shall be acceptable to the Architect.

1. Provide silk screen inks in colors and sheen as specified and manufactured by one of the following:
 - a. Naz-Dar Company: Chicago, Illinois.
 - b. Wornow Products Department, Dexter Corporation: Industry, California.
 - c. Colonial Printing Ink Company: East Rutherford, New Jersey.
 - d. Approved equal.

EE. Standoff Stainless-Steel Mounting Hardware: Utilize a stainless steel cap and barrel spacer mounting systems as detailed on the drawings and as manufactured by Gyford Standoff Systems or approved equal.

FF. Silicone Adhesive: Provide Ready to use, high performance adhesive such as General Electric GE 1200 sealant, translucent SCS 1201 (or approved equal) translucent silicone ready to use, high performance adhesive sealant (or approved equal) as recommended by manufacturer for bonding condition where required. This project shall be used in conjunction with foam tape to install all interior wall mounted plaque signs unless otherwise specified or required.

2.2 ACCESSORIES

- A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
- B. Anchoring Materials:
 1. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
 2. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 3. Water-Resistant Product: At exterior locations, provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.
- C. Fasteners: Unless otherwise indicated, use concealed fasteners fabricated from metals that are non-corrosive to either the sign material or mounting surface. All bolts, washers and nuts shall be stainless steel of T-316 alloy.
- D. Exposed Metal Fasteners: Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.

2.3 GENERAL FINISHES

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

- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved samples. Noticeable variations in the same piece are not

acceptable. 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.

- D. Corrosion Protection: Coat concealed metal surfaces which will be in direct contact with concrete, masonry, wood or dissimilar metals, in exterior work, and work to be built into exterior and below grade walls and decks, with a heavy coat of bituminous paint. Do not extend coating onto exposed surfaces.

2.4 ALUMINUM FINISHES

- A. Clear Anodic Finish: Manufacturer's standard Class 1 clear anodic coating, 0.018 mm or thicker, over a satin mechanical finish, complying with AAMA 611.
- B. Color Anodic Finish: Manufacturer's standard Class 1 integrally colored or electrolytically deposited color anodic coating, 0.018 mm or thicker, in the color specified on the drawings applied over a satin mechanical finish, complying with AAMA 611.
- C. Urethane Paint (On Aluminum): Paint shall be Matthews acrylic polyurethane (MAP), an ultraviolet inhibited aliphatic isocyanate/acrylic system. Applied in accordance with manufacturer's recommendations. The paint finish shall be eggshell or satin unless otherwise specified.
- D. Powder-Coat Finishes: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
- E. Aluminum Finishing: Aluminum finishes shall be acrylic polyurethane two-part catalyzed coating system. All coating applications shall be prepared and spray applied in the factory by skilled mechanics. All surfaces shall be mechanically sanded removing all grain lines, striations, and surface blemishes, cleaned with non-abrasive scouring pads, rinsed, and air-dried prior to receiving coatings.
 - 1. Coatings shall be prepared as designated by manufacturer's latest literature for surface preparation and application but in no case less than one (1) applicable primer coat and two (2) final full coats. All finished surfaces shall be uniform.
 - 2. Colors shall match color designations as indicated on the drawings.
- F. Anodizing: Exterior Applications - For a clear anodized (natural) finish use AA-M21C22A41 with a minimum 0.7 mil (0.02 mm). For a color anodized finish use AA-M21C22A42 with a minimum 0.7 mil (0.02mm) to match samples provided by Architect. Interior Applications - For a clear anodized (natural) finish use AAAA-M21C22A31 with a minimum 0.4 mil (0.01 mm). For a color anodized finish use AA-M21C22A32 with a minimum 0.4 mil (0.01 mm) to match samples provided by Architect/Engineer.

PART 3 - EXECUTION

3.1 SITE VISITS AND MEETINGS

- A. Site Visits: The Contractor shall conduct site visits as required during all stages of the project. The Contractor is reminded that all personnel must first check-in with the facility administration office to obtain any necessary badges, passes or training required. Verify with the Owner any requirements for on-site visits, security access and escorts. Request clarifications and specific instructions from the PT as needed.
 - 1. Always obtain a camera pass or other permission/authorization required before taking any pictures on site.

- B. Pre-Construction Meetings: Meetings with representatives from the PT at the beginning of a project are highly encouraged. These meetings help the Contractor to establish procedures for communication and coordination with PT.

- C. Pre-Installation Meetings on Site: Meetings at the project site with the sign installers are highly encouraged. These meetings should include a walk through the work area to identify any unanticipated site conditions and confirm the status of the construction.
- D. Contractor Orientation and Safety Training: All workers on site will be required to complete contractor orientation and safety training prior to beginning on-site work. Contractor badges for on-site all workers will be required at all times. The Contractor shall include the time needed to comply with these requirements as part of their base bid.
- E. Special Considerations: The Contractor is reminded that all personnel conducting on-site visits or work shall be required to comply with all facility or governmental rules and requirements.

3.2 PROJECT CONDITIONS AND COORDINATION

- A. Field Conditions: The Contractor shall inspect the existing field conditions and incorporate all necessary information on the shop drawings.
 - 1. Examine substrates, areas, and conditions, with the Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - 2. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- B. Field Measurements: Verify existing conditions and locations of all signs, anchorage devices and electrical service embedded in permanent construction by other installers. Verify all sign location conditions by field measurements prior to fabrication of signs and notify the Architect/Engineer of all conditions affecting fabrication or installation of signs. Indicate all measurements on shop drawings. Verify the sizes and other details of any existing foundations or other signage components specified to be re-used.
- C. Coordination: The Contractor must coordinate on-site work, access to site, and final sign placement with the Project Team for each installation.
 - 1. All foundations and structural supports for signs shall be provided by the Contractor, unless otherwise indicated.
 - 2. Where additional structural supports for signage or modifications to existing conditions surrounding building elements are required, it shall be provided by the Contractor in close coordination with the Project Team unless otherwise specified.
 - 3. Coordinate placement of anchorage devices with templates for installing signs.

3.3 CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall be responsible for all work done under his contract, including but not limited to:
 - 1. Faulty or improper work of subcontractor(s) and others under him by contract or otherwise;
 - 2. Diligent execution of work and giving his personal attention and supervision to same until completed;
 - 3. All delays caused by neglect on his part or of those under him by contract or otherwise;
 - 4. Compliance with all laws, ordinances and regulations bearing on the conduct of the work as drawn and specified.
 - 5. Obtaining, at his own cost, inspection certificates which may be required of the project by local authorities, or any other governing body. The Contractor shall procure and pay for all permits, licenses and approvals necessary for the execution of the work.

3.4 FABRICATION

- A. General: Shop fabrication and tolerances shall conform to the standards of the industry. All items shall be shop fabricated so far as practicable:
1. Signs shall have smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles.
 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration. Accurately machine, file, fit and rigidly frame together sign joints, corners, miters, etc., at joint and contact points.
 3. Attach materials with sufficient strength, number and spacing not to fail until materials joined are broken or permanently deformed.
 4. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 5. Fabricate all work to be truly straight, plumb, level and square and to sizes, shapes and profiles indicated on the approved shop drawings.
 6. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous. All exposed mechanical fasteners to be pre-painted and/or finished to match adjacent finish of sign color or sign component, with field touch-up paint to match.
 7. Edges and corners of finished letterforms and graphics true and clean.
 8. Isolate any dissimilar metals.
 9. Fabricate to profile indicated using structural angles, channels, plates, and similar shapes as required. Provide welded construction using mitered joints. Cut, drill, and tap units to receive hardware, bolts, and similar items.
- B. Workmanship: Form materials to shapes with straight lines, sharp angles and smooth curves, and hairline joints. Close forming, cutting and joining will be necessary.
1. Secure members, components and elements by mechanical fasteners of proper size and spacing as detailed, or otherwise required to rigidly hold members in place without distortion or deflection.
 2. Perform welding of the correct type to prevent distortions of flat surfaces and insure a sufficiently strong and safe installation. Isolate any dissimilar metals.
 3. Provide finished signs with properly aligned clean cut and sharp messages and borders. Fabricated signs must be free of wrinkles, bubbles, foreign matter, scratches, free of patches, or other visually identifiable defects. Ensure that finished background panels are essentially a plane surface.
 4. Signs shall be provided and installed complete with lettering, framing as detailed and all related components for a complete installation.
 5. Provide complete letter and sign fabrication systems including stiffeners, fasteners, welding, sealants, jointing, miscellaneous pieces, and material thickness required to provide high quality workmanship.
 6. Provide members, fasteners, and supports of size, reinforced, and detailed as required to meet design/performance criteria.
- C. Text and Graphics: All text and graphics must be reproduced accurately and free from distortion. Round positive or negative corners, nicked or ragged edges are not acceptable.
1. Arrows and symbols shall be reproduced exactly by photographic process and be submitted for approval prior to fabrication.
 2. All letterforms shall be of the computer-generated type, free of any distortion. Hand cut letterforms are subject to rejection.
 3. The Contractor is responsible for submitting and receiving approvals for any message layouts which

must be altered from specifications because of size constraints.

D. Painting:

1. In general, paint application shall be by airless spray.
2. Apply paint only when the relative humidity is below 85 percent and ambient temperature is above 55 degrees Fahrenheit.
3. Paint shall not be applied until the preceding coat has dried.
4. Clean and prepare surfaces according to the manufacturer's printed instructions.
5. Primer all surfaces according to the paint manufactures specifications.
6. Ferrous Metals:
 - a. Prepare surface by removing loose mill scale, rust, accessible slag or flux deposit, dirt or any foreign matter by power brushing. Remove oil and grease deposits by solvent.
 - b. After cleaning, give surface 1 shop coat of prime paint. Apply thoroughly and evenly to a dry surface. Surfaces inaccessible after assembly or erection shall be given an additional shop coat of a different color then the first coat. Each coat shall have a minimum dry film thickness of 2.5 mils.
7. Aluminum shall be pre-treated as recommended by the paint manufacturer, including:
 - a. Degreasing process and rinse.
 - b. Chemical etching process and rinse.
 - c. Deoxidizing process and rinse.
 - d. Chromate process ASTM B499, rinse and dry.
 - e. Prime surfaces with manufacturer's recommended primer.
 - f. Apply paint at the rate of 2.5 mils per coat by air or airless spray, brush or roller. Coating shall be even and free from any marks or streaks.
8. Before application of the finish paint, touch up all chipped or abraded areas within boundaries of graphic painting. Touch up paint shall be of same formulation and color as original paint.
9. Coatings applied by the approved method shall be thinned only to provide the required workability. Apply coats uniformly, free from runs and brush marks or streaking.
10. Comply with coating MAP's written instructions for cleaning, conversion coating, and applying.

3.5 DELIVERY AND HANDLING

- A. Delivery: Provide protective covering or crating as recommended by the manufacturer to protect sign components and surfaces against damage during transportation and delivery.
- B. Inspection: Inspect sign components for damage upon delivery. Do not install damaged sign components. Repair minor damage to signs, provided the finished repair is equal in all respects to the original work and is acceptable to the Owner; otherwise remove and replace damaged sign components.
- C. Coordination: Coordinate setting drawings, diagrams, templates, instructions and directions for the installation of items having integral anchors which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to applicable trades for installation. Coordinate time of delivery so that signs can be installed within a timely manner once delivered to the project site.
- D. Handling: Handle signs carefully to prevent breakage, surface abrasion, denting, soiling, and other defects. Comply with the manufacturer s handling instructions for unloading components subject to damage.

3.6 EXAMINATION

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

- B. Verify that concealed elements for support and anchorage for signs, including anchor inserts, are correctly located.
- C. Verify that electrical service provided under other sections of Work is correctly sized and located to accommodate signs.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Do not proceed with installation of sign work until unacceptable conditions, such as unpainted walls, door and other similar issues have been corrected and substrates are ready to receive sign work.
- E. Confirm that substrate finishes have been completed and cured sufficiently to receive sign materials.
- F. Confirm that substrates to receive signs are clean, free of deleterious substances that would detract from the neat appearance of high quality sign work, or that would interfere with the durable installation of sign work.
- G. The Contractor must coordinate on-site work, access to site, and final sign placement with the PT for each installation. Where structural supports for signage, or modifications to existing conditions surrounding building elements are required, it shall be provided by the Contractor.

3.7 REMOVAL OF EXISTING SIGNS

- A. General: The Contractor shall remove any existing signs that may be required in order to install new signs.
 - 1. Repair any visible damage to wall surfaces not covered by the replacement signs.
 - 2. Re-use of existing anchors or supports shall be the sole liability of the Contractor. Provide new anchors and supports as required.
- B. Disposal of Existing Signs: The Contractor shall dispose of all existing signs. All costs for signage removal and disposal shall be included in the Contractor's bid price.

3.8 INSTALLATION

- A. General: Field verify existing conditions prior to beginning installation activities. Notify the Project Team immediately to resolve potential conflicts or non-typical conditions.
 - 1. Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
 - 2. Lay out and install the work sign units level, plumb and at height and margins indicated, with sign surfaces free from distortion or other defects of appearance.
 - 3. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
 - 4. The installation of fixed material shall be under the general direction of the Architect/Engineer in accordance with applicable specifications and layout drawings.
 - 5. Patch existing surfaces damaged by installation.
- B. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Confirm that substrate finishes have been completed and cured sufficiently to receive sign materials. Confirm that substrates to receive signs are clean, free of deleterious substances that would detract from the neat appearance of high quality sign work, or that would interfere with the durable installation of sign work.

- C. Verify that anchors and electrical power are sized and located to accommodate signs.

- D. Proceed with installation only after unsatisfactory conditions have been corrected. Do not proceed with installation of sign work until unacceptable conditions, such as unpainted walls, door and other similar issues have been corrected and substrates are ready to receive sign work.
- E. The Contractor must coordinate on-site work, access to site, and final sign placement with the PT for each installation. Where structural supports for signage, or modifications to existing conditions surrounding building elements are required, it shall be provided by the Contractor.
- F. Preparation: Verify that substrates to receive signs are clean, free of deleterious substances that would detract from the neat appearance of high quality sign work, or that would interfere with the durable installation of sign work. Confirm that substrate finishes have been completed and cured sufficiently to receive sign materials. Identify electrical power locations provided by others prior to beginning installation.
- G. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations. All site work to be performed according to manufacturers' written instructions and warranty requirements.
- H. Anchors and Inserts: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of this work. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Provide toothed steel or lead shield expansion bolt devices for drilled-in-place anchors and inserts for exterior installation. Provide units with exposed surfaces matching the texture and finish of metal item anchored. NOTE: All exterior mounting hardware shall be non-corrosive.
- I. Erection: All surfaces shall be covered with protective cover non-deleterious to finish for protection until final installation or erection. Complete all connections in proper alignment and tighten bolts securely. Leveling is to be done only by instruments; measuring equal distances from existing building surfaces will not be acceptable as a basis of level and/or plumb. After erection, all surfaces marred during erection and exposed bolts, bolt heads, etc., shall be retouched with the same paint used previously.
 - 1. Stake all sign locations for approval by the Owner, Architect/Engineer and local authorities prior to beginning any installation activities to ensure the exact location of each sign element is approved.
 - 2. The Contractor is responsible for verification of all existing utilities and confirm all planned excavation and digging required is permitted.
- J. Packaging and Labeling: Label the back of all signs with the date of fabrication, sign sheeting system manufacturer, Type, and the fabricator's initials.
 - 1. Make the labels unobtrusive, but legible enough to be easily read by an observer on the ground when the sign is in its final position.
 - 2. Apply the label in a manner that is at least as durable as the sign face.
 - 3. Properly package signs to protect them during storage, shipment and handling to prevent damage to the sign face and panel.
 - 4. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.
- K. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
 - 1. Standard Installation: Utilize two-faced adhesive tape and clear silicone adhesive to install wall mounted signs unless their size or weight requires the use of mechanical fasteners. Do not use this method for vinyl-covered or rough surfaces.

2. Shim Plate Mounting: If required, provide concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other mounting methods are not practicable.

Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach panel signs to plate using method specified above.

3. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.
- L. Bracket-Mounted Signs: Provide manufacturer's standard brackets, fittings, and hardware for mounting signs that project at right angles from walls and ceilings. Attach brackets and fittings securely to walls and ceilings with concealed fasteners and anchoring devices to comply with manufacturer's written instructions.
- M. Room Identification Signs: Install signs according the ADA requirements on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- N. Dimensional Characters: Mount characters using standard fastening methods to comply with manufacturer's written instructions for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners. Characters shall be shaded as a solid for easy legibility of PT approval prior to installation.
 1. Flush Mounting: Mount characters with backs in contact with wall surface.
 2. Projected Mounting: Mount characters at projection distance from wall surface as indicated on the drawings.
- O. Special Instructions: Halt all work when notified of a proposed change, or if unsatisfactory results are anticipated. Notify the PT immediately and proceed only after receiving additional instructions from the Architect/Engineer. Do not proceed with installation of sign work until unacceptable conditions have been corrected and substrates are ready to receive sign work.
- P. Building Penetrations: Coordinate placement of anchorage devices with templates for installing signs. Seal all building penetrations as required by Architect/Engineer.

3.9 CLEANING AND PROTECTION

- A. Cleaning of Signs: After installation, clean soiled sign surfaces according to manufacturer's written instructions.
 1. Clean rods, fittings, and accessories thoroughly using synthetic scotch type pads and hot soapy water (or denatured alcohol or acetone) to remove residual coatings; rinse thoroughly with clear water and wipe dry.
- B. Cleaning of Premises: The Contractor shall use special care in the disposition of excess materials and rubbish.
 1. Rubbish shall not be allowed to accumulate but shall be consistently collected and removed at the completion of this work, on a daily basis.
 2. Storage for paint materials, preparation and mixing, shall be in well-lit and ventilated central location but shall not be allowed on finished or carpeted flooring.
 3. Adequate safeguards shall be provided against fire by placing oils, rags and waste in self-closing metal receptacles and shall be removed from the work and storage area at the end of each work shift. Under no circumstances will they be allowed to accumulate.

- C. Protective Coverings: Provide protective coverings, barriers, devices, and other procedures to protect finished work. If, despite such protection, finished work becomes damaged, engage other trades as needed to restore damaged work so no evidence remains of correction work.

1. Ample protection by means of drop cloths or layers of paper must be provided for existing apparatus or parts of the building.
 2. Restore protective coverings which have been damaged during shipment or installation of the work. Remove protection when requested for inspection of finishes and replace. Retain protective coverings intact and remove simultaneously from similar finished items to preclude non-uniform oxidation and discoloration.
 3. Remove protective coverings only when there is no possibility of damage from other work yet to be performed at the same location.
 4. Protect signs from damage until acceptance by the Owner.
- D. Repairs: Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.10 CLOSEOUT SUBMITTALS

- A. As Built Drawings: The Contractor shall submit "as built" drawings in digital PDF format.
- B. Maintenance Manuals and Instructions: Include written instructions for removal of signs attached to wall surfaces including recommended methods for removal of residual adhesives. Prior to final acceptance date, submit digital PDF files of operating and maintenance manuals with operating and maintenance instructions, parts listing, recommended parts inventory listing, purchase source listing, diagnostic and repair information available to manufacturer's and installer's maintenance personnel, emergency instructions and similar information organized behind labeled tabs.
- C. Braille Certification: Submit a certified letter as to the accuracy of all Braille messages in this graphics program. Certification shall be from a Library of Congress Braille translator, the Lighthouse for the Blind, or other source acceptable to the Owner.
- D. Product Certifications: Certify in writing that all products and materials for which data information was submitted and approved was utilized throughout contract as specified on the approved submittals and shop drawings.
- E. Warranty: Provide a manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
- F. Wiring Diagrams: The Contractor shall provide as-built wiring diagrams from the manufacturer for all illuminated signs and EVIDS components.

ISSUED	DATE
CONSTRUCTION DOCUMENTS	12/6/2021

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END OF SECTION

SECTION 10 2113.15
STAINLESS STEEL TOILET COMPARTMENTS

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes: Stainless-steel toilet compartments configured as toilet enclosures and and urinal screens.
- B. Related Requirements:
 - 1. Section 06 1000 "Rough Carpentry" for blocking.
 - 2. Section 10 2800 "Toilet, Bath, and Laundry Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories mounted on toilet compartments.

1.2 ACTION SUBMITTALS

- A. Shop Drawings: For toilet compartments.
 - 1. Include plans, elevations, sections, details, and attachment details.
 - 2. Show locations of cutouts for compartment-mounted toilet accessories.
 - 3. Show locations of reinforcements for compartment-mounted grab bars and locations of blocking for surface-mounted toilet accessories.
 - 4. Show locations of centerlines of toilet fixtures.
 - 5. Show locations of floor drains.
- B. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Each type of material, color, and finish required for toilet compartments, prepared on 6-inch-square Samples of same thickness and material indicated for Work.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of toilet compartment.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Measure in-place and existing construction as needed for fabrication and execution. No changes to Contract Sum or Contract Time will be allowed for differences between Drawing dimensions and field measurements.

PART 2 -PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & transportation barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and Florida Accessibility Code, Seventh Edition for toilet compartments designated as accessible.

2.2 MANUFACTURERS:

- A. All American Metal Corp
- B. American Sanitary Partition Corporation
- C. Bradley Corporation
- D. Flush Metal Partition, LLC

- E. General Partitions Mfg. Corp
- F. Global Partitions; ASI Group
- G. Hadrian Manufacturing Inc
- H. Toilet-Enclosure Style: Floor anchored.
- I. Urinal-Screen Style: Wall hung with integral flanges.
- J. Door, Panel, and Pilaster Construction: Seamless, metal facing sheets pressure laminated to core material; with continuous, interlocking molding strip or lapped-and-formed edge closures; corners secured by welding or clips and exposed welds ground smooth. Provide with no-sightline system. Exposed surfaces shall be free of pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections.
 - 1. Core Material: Manufacturer's standard sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch for doors and panels and 1-1/4 inches for pilasters.
 - 2. Grab-Bar Reinforcement: Provide concealed internal reinforcement for grab bars mounted on units of size and material adequate for panel to withstand applied downward load on grab bar of at least 250 lbf, when tested according to ASTM F 446, without deformation of panel.
 - 3. Tapping Reinforcement: Provide concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to units.
- K. Urinal-Screen Construction:
 - 1. Integral-Flange, Wall-Hung Urinal Screen: Similar to panel construction, with integral full-height flanges for wall attachment, and maximum 1-1/4 inches thick.
- L. Facing Sheets and Closures: Stainless-steel sheet of nominal thicknesses as follows:
 - 1. Pilasters, Braced at Both Ends: Manufacturer's standard thickness, but not less than 0.038 inch.
 - 2. Pilasters, Unbraced at One End: Manufacturer's standard thickness, but not less than 0.050 inch.
 - 3. Panels: Manufacturer's standard thickness, but not less than 0.031 inch.
 - 4. Doors: Manufacturer's standard thickness, but not less than 0.031 inch.
 - 5. Integral-Flange, Wall-Hung Urinal Screens: Manufacturer's standard thickness, but not less than 0.031 inch.
- M. Pilaster Shoes and Sleeves (Caps): Stainless-steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.
- N. Brackets (Fittings):
 - 1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.
- O. Stainless-Steel Finish: No. 4 bright, directional polish exposed faces. Protect exposed surfaces from damage by application of strippable, temporary protective covering before shipment.

2.3 HARDWARE AND ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard operating hardware and accessories.
 - 1. Material: Stainless steel.
 - 2. Hinges: Manufacturer's standard continuous, cam type that swings to a closed or partially open position [<>], allowing emergency access by lifting door.
 - 3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
 - 4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
 - 5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors[<>].
 - 6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.

- B. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel anchors compatible with related materials.

2.4 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M.
- B. Aluminum Extrusions: ASTM B 221.
- C. Brass Castings: ASTM B 584.
- D. Brass Extrusions: ASTM B 455.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- F. Stainless-Steel Castings: ASTM A 743/A 743M.
- G. Zamac: ASTM B 86, commercial zinc-alloy die castings, chrome plated.

2.5 FABRICATION

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories and solid blocking within panel where required for attachment of toilet accessories.
- B. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
- C. Door Size and Swings: Unless otherwise indicated, provide 24-inch- wide in-swinging doors for standard toilet compartments and 36-inch- wide out-swinging doors with minimum 32-inch- wide clear opening for compartments designated as accessible.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
 - 1. Confirm location and adequacy of blocking and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Coordinate layout and installation of supports, inserts, and anchors built into other units of work for toilet compartment anchorage.
- D. Verify location and adequacy of blocking and supports required for installation.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position indicated with manufacturer's recommended anchoring devices.
 - 1. Maximum Clearances:
 - a. Pilasters and Panels: 1/2 inch.
 - b. Panels and Walls: 1 inch.
 - 2. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.
 - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.

- b. Align brackets at pilasters with brackets at walls.
- B. Floor-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches into structural floor unless otherwise indicated in manufacturer recommendations. Level, plumb, and tighten pilasters. Hang doors and adjust so tops of doors are level with tops of pilasters when doors are in closed position.
- C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer recommendations for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors[<>] to return doors to fully closed position.

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END OF SECTION

**SECTION 10 2116.01
SOLID SURFACE SHOWERS AND VANITIES**

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. Shower panels.
 - 2. Shower receptors.
 - 3. Accessories.
- B. Related Sections:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for blocking.
 - 2. Section 102800 "Toilet, Bath, and Laundry Accessories" for additional accessories not included in this Section.
 - 3. Section 123661 "Simulated Stone Countertops".
 - 4. Division 22 Plumbing fixtures and Shower Receptors Trim for shower heads, valves, and controls.

1.3 REFERENCES

- A. American National Standards Institute (ANSI)
- B. International Cast Polymer Alliance (ICPA)
- C. National Fire Protection Agency (NFPA)

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: Include plans, elevations, sections, details, and attachments to other work. Show relationship of products to required wall framing, required blocking in walls, and wall finishes.
 - 1. Show locations of centerlines of drains.
- C. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Each type of material, color, and finish required for compartments, prepared on 3-inch- square Samples of same thickness and material indicated for the Work.

1.5 INFORMATIONAL SUBMITTALS

- A. Mock-up Templates: For each type of system specified, provide full-size template to the General Contractor. The mock-up template will be used for framing walls and for locating drain penetration through floor slab.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: To be included in maintenance manuals.

1.7 DELIVERY AND STORAGE

- A. Deliver materials in unopened factory packaging.

- B. Inspect materials at delivery to assure that specified products have been received.
- C. Store in original packaging in an interior climate-controlled location away from direct sunlight.

1.8 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: NFPA Class A as determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and Florida Accessibility Code, Seventh Edition for shower compartments designated as accessible.
- C. Provide solid surface material that conforms to ANSI/ICPA SS-1 for workmanship and finish, structural integrity and material characteristics.
- D. Provide shower receptors and shower panels that conform to ANSI Z124.1.2-2005.
- E. Provide vanity tops and sinks that conform to ANSI Z124.3-2005 when tested in the following areas:
 - 1. Color fastness – No change, 200 hours
 - 2. Wear and Cleaning – Passes
 - 3. Impact resistance – Passes
 - 4. Stain Resistance – Passes
 - 5. Chemical Resistance – Passes
 - 6. Drain Fitting Connection – Passes
 - 7. Loads on Lavatory Tops – Passes
 - 8. Thermal Shock Resistance – Passes
 - 9. Cigarette Burn Test – Passes
- F. Fungal and Bacterial Resistance: Provide solid surface material that does not support fungal and bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.

1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls, columns, ceilings, and other construction contiguous with shower and dressing compartments by field measurements before fabrication.
- B. Products shall be installed in an interior climate-controlled environment.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's warranty for manufactured solid surface products to be free of defects in material and workmanship. Each product must be warranted to function for the purpose for which it was designed for a period of ten (10) years from the date of purchase to the original buyer, provided it has been installed in accordance with the manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Subject to compliance with requirements, provide BioPrism® products by InPro Corporation. No substitutions permitted. Provide all shower receptors, shower panels and accessories from a single source.
- B. Shower Panels: Solid Surface sheet material, not less than 1/4 inch thick, seamless, with homogenous color and pattern throughout thickness of material. Meet or exceed ANSI Z124.1.2-2005 when tested for workmanship and finish, structural integrity and material characteristics.
 - 1. Edges: Eased.

2. Panel Trim:
 - a. Inside Corner L-Shaped, 1"x1"
- C. Shower Receptors:
 1. Size: 60 inch x 30 inch Roll-in Shower Base, ADA Compliant.
 2. Slope: 1:48 max.
 3. Threshold: ADA Threshold - 1/4" max beveled edge with 2:1 slope.
 4. Drain Assembly: Oatey number 42150, Brass, No-caulk, Drain w/Stainless Steel (standard) or Brass Strainer. Drain body is sealed to shower base with a fiber and rubber washer. Drain is secured to 2", 40 DWV pipe with a mechanically compressed gasket that does not require caulking. Drain top to accommodate 4-1/4" Universal Snap-Tite Strainer.

2.2 ACCESSORIES

- A. Toilet/Shower Accessories:
 1. Solid Surface Recessed Toiletry Shelf 12"w x18"h.
 2. Anchorages and Fasteners: Manufacturer's standard, exposed fasteners of stainless steel, chrome-plated steel, or solid brass, finished to match the items they are securing; with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.3 FINISHES

- A. Color, pattern and finish as indicated on Finish Drawings, selected by designer from manufacturer's full color palette.
- B. The composition of BioPrism® Solid Surface produces slight color variation between production cycles due to the innate and complex blending of natural minerals and man-made resin.

2.4 MISCELLANEOUS MATERIALS

- A. Epoxy Joint Adhesive:
 1. Manufacturer's standard two-part adhesive as required for inconspicuous, non-porous joints with a VOC content no greater than 70 g/L.
- B. Sealant:
 1. Highly elastomeric, mildew-resistant, 100% silicone sealant.
 2. Specifically formulated for applications indicated, including wet areas.
 3. Sealant shall have a VOC less than or equal to 250 g/L.
- C. Adhesives and sealants shall contain no carcinogen or reproductive toxicant components present at more than 1% of total mass of the product as defined in the California Office of Environmental Health Hazard Assessment's (OEHHA) list entitled "Chemicals Known to the State to Cause Cancer" or the Reproductive Toxicity, Safe Drinking Water, and Toxic Enforcement Act of 1986 (Proposition 65).

PART 3 - EXECUTION

3.1 COORDINATION

- A. Attend pre-installation conference, chaired by the General Contractor, to coordinate with other trades working in immediate area.

3.2 EXAMINATION

- A. Verify that framing, wall and floor surfaces, and other conditions, are ready to receive work of this Section.
- B. Notify Architect of any existing conditions which will adversely affect execution.
- C. Beginning of execution will constitute acceptance of existing conditions.

3.3 PREPARATION

- A. Clean and prepare substrate surfaces as recommended by manufacturer.
- B. Shower bases and live loads are to be fully supported by the substrate.

3.4 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install compartments rigid, straight, level, and plumb. Scribe adjacent surfaces. Secure compartments in position with manufacturer's recommended anchoring devices.
- B. At completion of the installation, clean surfaces in accordance with the manufacturer's clean-up and maintenance instructions.

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END OF SECTION

**SECTION 10 2213
WIRE MESH PARTITIONS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wire mesh systems for walls and ceilings.

1.2 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel 2020.
- C. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

1.3 SUBMITTALS

- A. Product Data: Provide data for mesh materials, finishes.
- B. Shop Drawings: Indicate plan and vertical dimensions, elevations, component details; head, jamb, and sill details; location of hardware. Provide component details, anchorage, and type and location of fasteners.
 - 1. Show field measurements on shop drawings.
- C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Wire Mesh Partitions:
 - 1. Acorn Wire and Iron Works, Inc; Heavy Duty 6-Gauge: www.acornwire.com/#sle.
 - 2. The G-S Company; Sure Guard Heavy Duty: www.g-sco.com/#sle.
 - 3. Spaceguard Products; BeastWire Mesh Partitions with Heavy-Duty Welded Wire Mesh- 2 inch square: www.spaceguardproducts.com/#sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.2 WIRE MESH PARTITIONS

- A. Wire Mesh Partitions: Factory-fabricated modular assemblies of panels, doors, anchors, hardware, and accessories as required to provide a complete system.
 - 1. Design Criteria:
 - a. Design partition system to provide for movement of components without damage, undue stress on fasteners or other detrimental effects, when subject to design loads.
 - b. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.3 COMPONENTS

- A. Woven Wire Mesh: Heavy duty.
 - 1. Material: ASTM A510/A510M uncoated crimped steel wire.
 - 2. Wire Size: 6 gage, 0.192 inch.

- 3. Mesh Opening Size: 2 inch diamond shape.
- 4. Mesh Weave: Plain weave, double crimped.
- B. Framing and Support Members:
 - 1. Material: ASTM A36/A36M steel shapes and ASTM A500/A500M cold-formed steel.
 - 2. Framing, Corner Posts, and Intermediate Support Members: Manufacturer's standard sizes for system specified and as indicated on drawings.
 - 3. Vertical Stiffeners: As required for partitions greater than 144 inches in height.
- C. Doors: Same material as partitions, fully framed; manufacturer's standard construction and hardware for swing operation.
 - 1. Locking:
 - a. Electric Strike and prep for Proximity type Card Reader by security contractor.
 - b. Panic exit device.
- D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.4 FASTENERS

- A. Bolts, Nuts and Washers: Hot dip galvanized.
- B. Anchorage Devices: Provide power driven, powder actuated, and drilled expansion bolts.
- C. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with design of structure.

2.5 ACCESSORIES

- A. Bracing: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
- B. Plates, Gussets, Clips: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
- C. Post Caps: Manufacturer's standard.
- D. Floor and Ceiling Pilaster Shoe: Manufacturer's standard.
- E. Floor Base: Manufacturer's standard.

2.6 FABRICATION

- A. Fit and assemble in largest practical sections for delivery to site, ready for installation.
- B. Make exposed joints flush or tight.
- C. Provide mortised and tenoned joints for framing members.
- D. Provide components required for anchorage to adjacent construction.
- E. Frame openings made for penetrating mechanical and electrical components.

2.7 FINISHES

- A. Painted Finish: Manufacturer's standard powder coat finish.
 - 1. Color: Black.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.

- B. Verify that substrate surfaces and required openings are ready to receive work.

3.2 PREPARATION

- A. Clean substrate surfaces.
- B. Clean partition surfaces of rust, scale, grease, and foreign matter prior to field finishing as specified in Section 09 9123.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install items plumb and level, accurately fitted, free from distortion or defects.
- C. Perform field welding in accordance with AWS D1.1/D1.1M.
- D. After installation, touch-up field welds scratched or damaged surfaces with shop applied finish.

3.4 TOLERANCES

- A. Maximum Variation From Plumb or Level: 1/4 inch.
- B. Maximum Misalignment From True Position: 1/4 inch.

3.5 ADJUSTING

- A. Adjust doors to achieve free movement.

3.6 CLEANING

- A. Remove temporary protection to prefinished surfaces.

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**SECTION 10 2239
FOLDING PANEL PARTITIONS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Top-supported folding panel partitions, horizontal opening.

1.2 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Steel track support.
- B. Section 06 1053 - Miscellaneous Rough Carpentry: Wood blocking and track support shimming.

1.3 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- B. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- D. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- E. ASTM E413 - Classification for Rating Sound Insulation 2016.
- F. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions 2012 (Reapproved 2020).
- G. ASTM E596 - Standard Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures 1996 (Reapproved 2016).
- H. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics 2015.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene at project site seven calendar days prior to scheduled beginning of construction activities of this section to review section requirements.
 - 1. Require attendance by representatives of installer.

1.5 SUBMITTALS

- A. Product Data: Provide data on partition materials, operation, hardware and accessories, electric operating components, track switching components, and colors and finishes available.
- B. Design Data: Design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, showing loads at points of attachment to the building structure.
- C. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, location and details of pass door and frame, adjacent construction and finish trim, and stacking depth.
- D. Samples for Selection: Submit two samples of full manufacturer's color range for selection of colors.
- E. Samples for Review: Submit two samples of surface finish, 12 by 12 inches size, illustrating quality, colors selected, texture, and weight.
- F. Certificates: Certify that partition system meets or exceeds specified acoustic requirements.

- G. Manufacturer's Instructions: Indicate special procedures.
- H. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until installation.

1.8 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within five year period after Date of Substantial Completion.
- C. Provide two year manufacturer warranty against defects in material and workmanship, excluding abuse.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Folding Panel Partitions - Horizontal Opening:
 - 1. Basis of Design Product: Subject to compliance with requirements, provide Modernfold, a DORMA Group Company, Acousti-Seal Legacy: www.modernfold.com or a comparable product by one of the following.
 - 2. Hufcor, Inc: www.hufcor.com/#sle.
 - 3. Moderco, Inc: www.moderco.com/#sle.
 - 4. Panelfold, Inc: www.panelfold.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.2 FOLDING PANEL PARTITIONS - HORIZONTAL OPENING

- A. Folding Panel Partitions: Side opening; individual panels; side stacking; motor operated.
- B. Panel Construction:
 - 1. Frame: 16 gage, 0.0598 inch thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.
 - 2. Panel Substrate Facing: Steel sheet, manufacturer's standard thickness.
 - 3. Panel Properties:
 - a. Thickness With Finish: 3 inches.
 - b. Width: Standard width.
 - c. Weight: 8 lb/sq ft.
- C. Panel Finishes:
 - 1. Facing: To be selected from manufacturer's full range of finish options.
- D. Panel Seals:
 - 1. Panel to Panel Seals: Grooved and gasketed astragals, with continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.
 - 2. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.

- E. Suspension System:
 - 1. Track: Formed steel; 1-1/4 by 1-1/4 inch size; thickness and profile designed to support loads, steel sub-channel and track connectors, and track switches.
 - 2. Carriers: Steel, ball bearing wheels on trolley carrier at top of every panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.
- F. Performance:
 - 1. Acoustic Performance:
 - a. Noise Reduction Coefficient (NRC): ASTM E596, NRC of 0.65 minimum.
 - b. Sound Transmission Class (STC): 48 to 52 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, on panel size of 100 sq ft.
 - 2. Surface Burning Characteristics of Panel Finish: Flame spread/smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
 - 3. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
- G. Accessories:
 - 1. Ceiling Closure: White enameled ceiling closure; aluminum jamb and head molding, fittings and attachments.
 - 2. Pocket Enclosures: Door, frame, and trim to match adjacent walls.
 - 3. Acoustic Sealant: As recommended by partition manufacturer.

2.3 MATERIALS

- A. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Standard Gypsum Board: ASTM C1396/C1396M, 3/8 inch thick, maximum permissible length; ends square cut, square edges.
- C. Vinyl Coated Fabric: ASTM F793 Category VI, polyvinyl fluoride (PVC) finish for washability and improved flame retardance; color as selected by Architect from manufacturer's standard range.
- D. Acoustic Insulation:
 - 1. Type: As required for acoustic performance indicated.
 - 2. Thickness: As required for acoustic performance indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated on shop drawings.
- B. Verify track supports are laterally braced and will permit track to be level within 1/4 inch of required position and parallel to the floor surface.
- C. Verify floor flatness of 1/8 inch in 10 feet, non-cumulative.
- D. Verify wall plumbness of 1/8 inch in 10 feet, non-cumulative.

3.2 INSTALLATION

- A. Install partition in accordance with manufacturer's instructions and ASTM E557.
- B. Fit and align partition assembly and pocket doors level and plumb.
- C. Lubricate moving components.
- D. Install acoustic sealant to achieve required acoustic performance.

3.3 ADJUSTING

- A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.
- C. Adjust partition assembly to achieve lightproof seal.

3.4 CLEANING

- A. Clean finish surfaces and partition accessories.

3.5 CLOSEOUT ACTIVITIES

- A. Demonstrate operation of partition and identify potential operational problems.

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